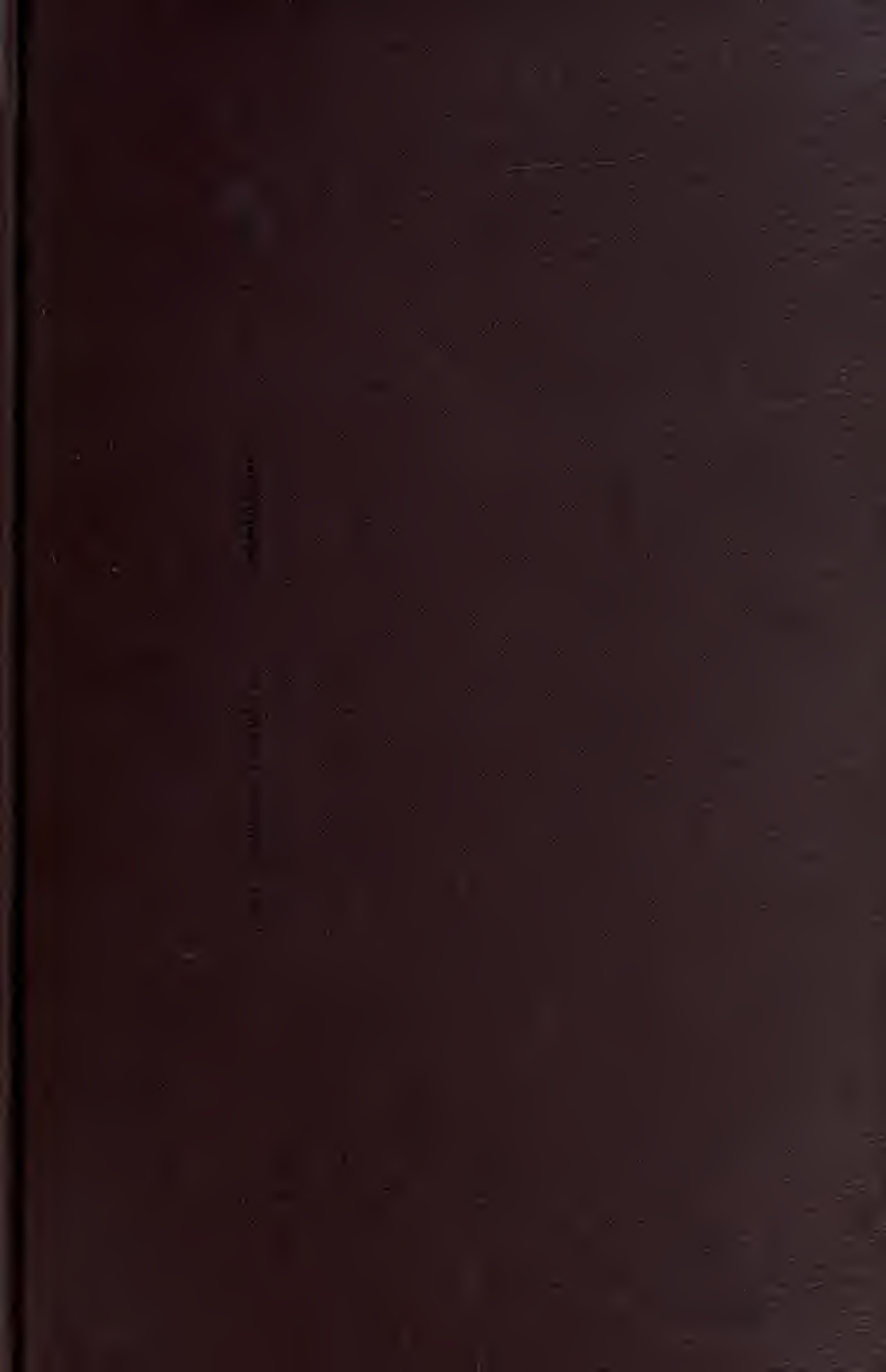






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THE



BIRMINGHAM

MEDICAL REVIEW :

A MONTHLY JOURNAL

OF

THE MEDICAL SCIENCES.

EDITED BY

J. JAMESON EVANS, M.D., F.R.C.S.,

AND

BECKWITH WHITEHOUSE, M.S., F.R.C.S.

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LATE INFECTION AFTER SCLEROSTOMY.*

By T. HARRISON BUTLER, M.D., Oxon., *Assistant Surgeon to the Birmingham and Midland Eye Hospital; Honorary Ophthalmic Surgeon to the Coventry and Warwickshire Hospital, and to the Warneford, Leamington, and South Warwickshire General Hospital.*

IT has long been felt that, great as is the service rendered by iridectomy in cases of glaucoma, both acute and chronic, yet the problem is far from having been completely solved. In acute cases iridectomy, which was introduced by Von Graefe, is on the whole a very satisfactory operation, which gives favourable results in about 80 per cent. of the patients. The same cannot be said of its action in chronic glaucoma. In some cases its effect is transient; in others the intervention entirely fails to relieve the symptoms, and may even exacerbate the disease. In consequence ophthalmologists have striven to discover a better mode of treatment. It was noted that those cases of iridectomy, in which the iris had become entangled in the wound, and a fistulous scar had developed, were often very successful, but such a condition often caused chronic irritation, and occasionally the eye was lost from an infective process, chronic or acute. On this account the deliberate attempt to leave a tag of iris in the wound never met with any general approval. Still it was felt that a fistulous scar was a desirable result if only it could be attained safely. During the past decade several opera-

*Read to the Midland Ophthalmological Society at the Shrewsbury meeting, June 18th, 1915 (modified and amplified for publication).

tions have been devised, which aim at leaving a permanent communication between the interior of the eye and the subconjunctival space. Chief among these we have Lagrange's sclerectomy, Elliot's trephine operation, Herbert's wedge isolation method, and Holth's punch operation. All these operations are performed by members of this society, some choosing one, some another, as best suited to his technique. All aim at producing a permanent drainage of the anterior chamber by means of a filtering scar, and probably all are equally successful. At the present time sclerectomy or sclerotomy is being performed by most ophthalmic surgeons all over the world, and many of them are enthusiastic in praise of the peculiar method they favour. There are, however, many disadvantages in sclerostomy. In quite a number of cases the aperture made in the sclera heals up solidly, and no filtration takes place. In others a large ectatic scar develops, which is unsightly and dangerous. In a third group of cases, in spite of an apparently satisfactory filtering scar, the tension remains high. The operation is in fact far from ideal. Better results are obtained by most surgeons if an iridectomy, complete or local, be added to the sclerostomy. These objections are not vital, and can, to a large extent, be avoided by better technique. There is unfortunately one complication which is inherent, and, as far as I can see, cannot be guarded against. Late infection of the eye is a tragedy which in my opinion will ultimately restrict the operation to cases in which iridectomy has failed or obviously will not succeed.

This dire calamity did not receive much attention at first, but during the past two years cases have been recorded with increasing frequency, and many surgeons have grown anxious regarding the future of some of their patients. At the Ophthalmological Congress at Oxford last July there was a discussion upon the subject, and several of the surgeons present, both English and American, recounted instances of late infection which had occurred in their practice.

Up to this year I had personally only experienced one case, and looked upon late infection as a misfortune which must

occasionally happen, but not in such frequency as to nullify the advantages of the method. But during the last six months seven more cases—a veritable epidemic—have developed among my patients, and my experience has been so calamitous that I now regard late infection as a sword of Damocles suspended over every patient who is unfortunate enough to possess a filtering scar. The matter is of such vital importance that I am compelled to bring these cases to your notice. I shall do so under three heads: Acute cases, subacute examples, and slight infections.

ACUTE CASES.

D., male, aged 36. A case of heterochromic cyclitis, which developed cataract, and ultimately glaucoma. The lens was successfully extracted, and a vision of 6/5 and J1 was attained, and maintained for a year. Then the disc showed signs of cupping, and a condition of chronic glaucoma developed. On January 24th, 1910, the eye was trephined below, and a basal iridectomy was performed. The trephine hole healed up rapidly and solidly, and only for a short time was any sign of filtration present. The eye gradually became blind, owing to atrophy of the optic nerve and opacity of the vitreous.

On February 15th, 1915, five years after the operation, the patient appeared with an infected eye. The anterior chamber was full of pus, and there was present a large intercalary staphyloma. The eye was removed, and a second staphyloma was found in the posterior segment of the globe.

I had not seen the case for a year, and so am not able to state positively that the condition of the eye was not the natural ultimate end of the chronic cyclitis. The history, however, suggested that the eye had suddenly become inflamed, and I regard the case as an example of late infection.

H., aged 35, an alcoholic female. Chronic glaucoma with deeply cupped optic disc. $VR=6/60$, $VL=\text{hand reflex}$, $TR=82$ mm. of Hg., $TL=72$ mm. of Hg.

February 9th, 1914. A punch operation by Holth's method was performed upon the left eye. There was a very slight loss of vitreous, so no iridectomy was added, and the

conjunctival flap was not sutured. When the eye was dressed 48 hours later the flap was found rolled back and the punch hole was open to the air. An anæsthetic was given, and the flap sutured in place.

On February 16th, 1914, the right eye was treated in the same way, but iridectomy was performed.

March 30th, 1915. VR and L=6/18. T normal on both sides. Good filtering scars, but no large blebs. A note was made that the condition of each eye was "satisfactory." A year after the operation the tension was normal, and the vision had increased from 6/60 and hand reflex to 6/18.

In May, 1915, fifteen months after the operation, the patient appeared with the right eye in a state of acute panophthalmitis. This was the eye which had sustained a perfectly normal operation. The patient stated that a fortnight previously the left lower lid had become "ulcerated," but got well. Then the right eye became similarly affected, and three days before she came up, the eye suddenly became very red and painful. The globe was eviscerated. Here we have a clear case of a late infection from a severe conjunctivitis, which led to the total loss of a useful eye.

On June 21st the left eye was found to be in a state of acute iritis. There was much injection round the filtering scar, but no sign of any yellowish infiltration. Under treatment with atropine and the "muff warmer," combined with large doses of salicylates, the eye made a complete recovery. This is an example of a mild late infection, which, had it been a little more severe, would have left the patient totally blind.

J., male, aged 64. Chronic glaucoma. VR=6/24. VL=hand reflex. T+1 on each side.

February 20th, 1914. Holth's punch operation with a local iridectomy. The flap was slightly buttonholed, but the tear was sewn up, and healed normally.

February 27th, 1914. Right punch operation with a complete iridectomy.

March 13th, 1914. T. normal in each eye both by palpation and by the Schiötz tonometer. The condition is satisfac-

tory; there is on each side a good filtering scar, but no large bleb. VL increased to fingers at one foot. VR=6/12.

April 19th, 1915. After a lapse of fourteen months from the operation the patient appeared, and said that his eye had been painful for three days. There is a yellowish swelling over the site of the operation. Intense general injection of the globe, a hypopyon half fills the anterior chamber. T+1, V= perception of light only. The right eye is in good condition. Under treatment the acute iridocyclitis quieted down, the hypopyon was absorbed, and the bleb flattened down. The eye, however, became very soft, and remained injected. It was excised on May 14th, 1915.

SUB-ACUTE CASE.

L., aged 51, alcoholic female.

On April 16th, 1913, came up with sub-acute glaucoma, which had been present "on and off" for months. VR=6/18, T+1.

April 16th, 1913. Punch operation, with a small peripheral iridectomy. The operation reduced the tension to $-\frac{1}{2}$, but the vision fell to no perception of light. No bleb formed, but there was a satisfactory filtering scar.

On August 6th, 1913, she was stung by a wasp on the right eyelid. The lid became much swollen and the eye inflamed. She appeared on September 17th, and was found to have acute iritis. The punch hole was covered by a yellowish white opaque conjunctiva. Under treatment the iritis quieted down, but the hole in the sclera cicatrised firmly. The eye became slightly hard, but there has been no more pain.

MILD CASES.

The example of slight iritis in H. has been already described.

S., aged 70, female. Some paralysis agitans. Suffering from chronic glaucoma. T+1 on each side.

January 21st, 1914. Left eye operated upon by Holth's method, with a small basal iridectomy. February 4th, 1914, a similar operation was performed upon the right eye. Large

ectatic blebs developed in each globe, but the operation was very successful in lowering tension, and vision was well maintained.

November 13th, 1914, eight months after the operation, the left eye became infected. The scar is swollen and yellowish, and there is considerable œdema of the surrounding conjunctiva. There is a severe iridocyclitis with posterior synechiæ, and great pain. Under atropine and dry heat the eye made a perfect recovery.

G., aged 60, female. The right eye has been removed; it contained a malignant tumour. On June 29th, 1914, the left eye was punched for chronic glaucoma, which had slowly developed in spite of treatment with miotics. The operation caused a large ectatic bleb, which was successful in keeping the tension a little below normal. On May 18th, 1915, I showed the patient to my house surgeon, and pointed out that the scar was very thin and the eye liable to late infection. My words were prophetic, for on June 4th, a little over eleven months after the operation, the patient appeared with an infected scar. The whole area of the bleb and the surrounding conjunctiva was milk-white, and there was much injection of the conjunctiva with circum-corneal injection. The iris had a normal appearance, and the pupil moved freely. A culture upon blood serum grew a luxuriant crop of a greenish brown mould, which was examined in the Pathological Department of the Birmingham University, and recognised as *mucor septatus*. Fortunately this infection proved very benign. It even did good, for the ectatic scar flattened down, and is now much more satisfactory and safer than before.

F., aged 52, female. The right eye was blind from chronic glaucoma. The left eye gradually lost vision, and the field contracted in spite of miotic treatment. The left eye was punched on July 21st, 1914. A satisfactory filtering scar developed, and the glaucomatous process was definitely arrested.

On June 4th, 1914, ten months after the operation, acute iritis, accompanied by a conjunctival discharge, set in. Posterior

synechiæ developed, and precipitates were noted on Descemet's membrane. The patient's only eye was in serious danger of being lost, but fortunately the iridocyclitis yielded to treatment, and the eye quieted down, and is no worse for the inflammation.

Up to the present eight of my cases have been affected with late infection, most of them about a year after a successful operation. The cases show that late infection renders the operation undesirable, except in cases where iridectomy has failed to arrest the disease. The complication has befallen all classes of scars, those that barely filtered at all, satisfactory scars, and ectatic scars. Three eyes have been removed, and are totally blinded. In three other cases the patient's only eye has been seriously imperilled. Many of the cases would, I feel sure, have been equally well served by an iridectomy, which is not liable to this grave peril.

Last year Mr. Jameson Evans and myself analysed all our operations for glaucoma extending over a period of five years. To our astonishment we found that the cases treated by iridectomy had done at least as well as those upon which some form of sclerostomy had been performed. We presented our analysis to the Oxford Ophthalmological Congress last July, and the discussion which followed dealt largely with late infection, as stated above. If it is really a fact that iridectomy is as successful, or nearly as successful as sclerostomy, then it is time that ophthalmic surgeons abandoned the more modern but dangerous operations. It has for decades been well recognised that the cystoid filtering scar, which occasionally complicates cataract extraction, is a very dangerous condition, which has frequently led to the loss of eyes from septic infection. Surgeons have always striven to clear the wound of tags of capsule and iris, and yet during the past ten years we have all been deliberately trying to create a fistulous scar. The tide of sclerostomy has, however, reached high-water mark, and the ebb has begun in earnest. Already many surgeons are regarding these operations with suspicion, and some, more far-seeing than the majority, have from the first left them severely alone.

The time has arrived to endeavour to improve the operation of iridectomy. I have quite given up the old-fashioned broad iridectomy in favour of a very narrow excision of iris performed with a Taylor's bent broad needle and Matthieu's forceps, forceps which open freely in a small incision. These narrow wounds heal very rapidly, and I believe such an iridectomy is as efficient as a broad one involving one-third of the iris periphery.

REPORTS OF SOCIETIES.

MIDLAND OPHTHALMOLOGICAL SOCIETY.

THE fifth meeting of the session was held at the Shrewsbury Eye and Ear Hospital on the 1st of June. MR. RUSS WOOD was voted to the chair in the absence of the President.

Mr. Harrison Butler read notes on five cases of late infection after sclerostomy for glaucoma. The paper is published *in extenso* in the present issue of the *Birmingham Medical Review*.

Mr. Russ Wood read notes on a case of acute recurrent retrobulbar neuritis in a young girl (*vide Birmingham Medical Review*, June, 1915), and a short paper on "Some Cases of Choroidal Sclerosis."

Messrs. Russ Wood and Anderson showed specimens of glioma of the retina and sarcoma of the choroid and exhibited a spring-point protector for McHardy's perimeter.

Mr. Jameson Evans showed specimens of pigmented epibulbar carcinoma and pigmented conjunctival sarcoma

Mr. Harrison Butler exhibited a Davidson's electric ophthalmoscope.

Messrs. Russ Wood and Anderson showed a large number of interesting cases, including :—

An unusual case of retinal detachment.

Rupture of the Choroid.

Choroidal Sclerosis.

Malignant myopia.

Choroiditis of the familial type associated with bacilluria.

Colobomata of the lenses in unusual positions.

Albuminuric retinitis.

ABSTRACTS.

MEDICINE.

BILATERAL LESION IN THE OCCIPITAL LOBES.

BYROM BRAMWELL (*Edinburgh Medical Journal*, July, 1915) records an interesting and highly instructive case of bilateral lesion in the occipital lobes correctly diagnosed twenty-four years before death. The case is completed by a detailed *post mortem* examination and a histo-pathological report by Dr. Shaw Bolton showing the position of the cortical area for macular as distinct from non-macular or panoramic vision.

The details of the case are given as follows :—

Acute general dropsy (probably due to acute nephritis); epileptiform convulsions; sudden and permanent loss of peripheral vision, the fields being enormously contracted; central vision both for white and for colours fairly good; fundi oculorum normal; no mind-blindness and no word-blindness. The diagnosis made twenty-four years before death was "probably a simultaneous bilateral lesion in the occipital lobes"; death at the age of 71, twenty-six and a half years after the onset, from acute croupous pneumonia. During these twenty-six and a half years there were no fresh head symptoms, and practically no change in vision, no motor paralysis, no loss of sensation, no aphasia, sensory or motor.

Careful examination of the eyes were made at different times by Dr. Berry and Dr. Sinclair. The vision was $\frac{3}{8}$ in 1886, $\frac{1}{2}$ in 1891, and $\frac{6}{8}$ in 1905, the latter depreciation having followed an attack of scurvy in 1891. In 1905 the contraction of the fields was more marked on the left side (5°) than on the right side (10°), and more on the left side of the fixation spot, which was probably encroached on in both eyes. The optic discs showed some grey atrophy. There was no optic atrophy noted in 1886.

Post mortem examination.—Head: The dura mater was somewhat thickened and adherent at the vertex. The arteries at the base of the brain were somewhat atheromatous—a marked patch of atheroma was situated in the right posterior cerebral artery just beyond its junction with the circle of Willis, and another on the left common carotid artery just at its junction with the circle of Willis. The convolutions of the brain, more particularly of the frontal lobes, were somewhat atrophied and separated by deep sulci—apparently a senile change.

A large lesion was present in each occipital lobe, and a small superficial lesion in the adjacent part of the right temporo-sphenoidal lobe (posterior end of the middle temporo-sphenoidal convolution. In the right occipital lobe an extensive lesion was seen; a marked depression in the middle of the lobe and shrinking-in of the convolutions, with discolouration, involving more particularly the upper and middle convolutions; the lower convolution at its tip and the visual area (cuneus and calcarine area) appeared to be normal. In the left occipital lobe there was a marked depression on the upper surface, apparently leading into a cavity in the interior of the brain. The surrounding convolutions were plump and apparently normal.

Viewed from the side there was marked depression at the junction of the right occipital lobe with the back part of the temporo-sphenoidal lobe. A small part of the posterior end of the right middle temporo-sphenoidal convolution was shrunken and atrophied (the result of an old softening).

There was also an area of superficial softening in the middle part of the middle and lower temporo-sphenoidal convolutions on the left side; it was separated from the occipital lobe by an area of normal brain tissue measuring an inch from before backwards.

After separating the cerebellum and looking at the back part of the base of the brain from below, there was a marked depression on the right side at the junction of the occipital and the temporo-sphenoidal lobes. The convolutions of the occipital

lobes (both right and left) on their under surfaces were plump and normal. The lateral ventricles were greatly dilated.

Nature of the Brain Lesion.—Extensive destruction of the white matter and part of the cortex of the left occipital lobe and very extensive destruction of the white and grey matter of the right occipital lobe. The lesions apparently were the result of old softenings probably from the very sudden onset, embolic in origin, with great secondary (compensatory) dilatation of the lateral ventricles.

Dr. Shaw Bolton's report on the condition of the brain was as follows :—

“ The fact that the visuo-sensory area generally is normal in distribution makes it certain that the gross contraction of the visual fields which is found clinically is due to an associative block, and that this block is not quite so complete on the left side of the visual apparatus as on the right (and in the right fields of vision as in the left) in association with a smaller or less important lesion on the left side of the cortex. This is indicated histologically by the diffuse atrophy of the visuo-sensory cortex, which is everywhere marked, with the exception of the more central (calcarine) portion.

“ It would therefore appear that the calcarine core of the visuo-sensory area serves in some degree as an anatomical basis for macular as distinct from non-macular or panoramic vision. This conclusion is supported by the fact that the lesion in the right hemisphere reaches up to the posterior portion of the calcarine core. This fact at the same time incidentally explains why in this case the right field of (central) vision was a little more extensive than the left.

“ It appears, therefore, to be probable that human macular vision is an evolution dependent on (1) the development of binocular vision, *i.e.*, on the employment of corresponding parts of the retinae simultaneously, and on (2) the simultaneous development of the capability to pay prolonged and individual attention to particular points of the general visual panorama. Macular vision is thus superposed on the neuronc apparatus for panoramic, and the two types shade into one another, the

central parts of the retinae and the corresponding central (calcarine) cores of the pear-shaped visuo-sensory areas being the parts concurrently employed in macular vision.

"The associative block caused by the lesions in this case, therefore, being greater on the right side than on the left, must thus be regarded as having been enough to stop the passage of feebler panoramic stimuli without interfering seriously with the macular and stronger visual stimuli.

"The continued passage of the latter has prevented the onset, in the calcarine core of the visuo-sensory area, of the diffuse atrophy which elsewhere in this area is general. Lastly, the slight maiming of the right calcarine core posteriorly is responsible for the fact that the clinical visual field of the case was rather less extended on the left side.

"The histological investigation of this case may thus claim not only to have explained the clinical features present during life, but to have added to our knowledge of the part played by the visuo-sensory area in macular and in non-macular or panoramic vision. It may, in fact, be stated that the anatomical basis of the former is the cortex of the calcarine core of the pear-shaped visuo-sensory area, and that the anatomical basis of the latter lies in the surrounding and remaining visuo-sensory cortex.

"It is impossible to form any opinion, histologically, on the subject of colour vision, and it is as certain as it can be from recent researches that colour vision is the result of purely chemical processes which take place in the *retina*."

THERAPEUTICS.

SUBSTITUTES FOR GERMAN DRUGS.

THE War has brought forcibly to our notice the extent to which the Germans had been allowed to control the British drug trade. Many drugs hitherto regarded as British products have been found unavailable or procurable only at greatly enhanced prices owing to the fact that they were "made in Germany," whilst others are difficult to get because they were

products made by one or other of our Allies whose factories have been put out of action by the War. Practitioners will be glad of information which will enable them to distinguish "alien" from "allied" productions and help them in the selection of suitable substitutes which will enable them to prescribe with due regard to patriotism and economy as well as the welfare of the patients.

The Prescriber (January and March, 1915) publishes the following list of the more important of these products with their chemical equivalents. The list is by no means complete, but in case of doubt the best procedure is to prescribe the drug under its original name and to add the words "British substitute," leaving the selection to the pharmacist.

GERMAN PRODUCT.

BRITISH EQUIVALENT.

- AIROL : *Bismuthi Oxyiodogallas*.
 ALYPIN : *Amydricainæ Hydrochloridum*.
 ANTIPYRIN : *Phenazonum*.
 ANUSOL : *Sanusin*.
 ARISTOL : *Thymolis Iodidum*.
 ASPIRIN : *Acidum Acetyl-salicylicum*, B.P.
 BENZOZOL : *Guaiacol Benzoas*.
 BROMIPIN : *Brominol*.
 CHLORALAMID : *Chloral formamidum*, B.P.
 CREOSOTAL : *Creosoti Carbonas*.
 CYSTOPURIN : *Urosolvène*.
 DERMATOL : *Bismuthi Subgallas*.
 DIONIN : *Ethylmorphinæ Hydrochloridum*.
 DIURETIN : *Theobrominæ et Sodii Salicylas*, B.P.
 DUOTAL : *Guaiacol Carbonas*, B.P.
 EAU DE COLOGNE : *Spiritus Coloniensis*, B.P.C. (many excellent British brands are obtainable).
 EUCAINE (beta) LACTATE : *Benzaminæ Lactas*, B.P.
 EUQUININE : *Quininæ Ethylcarbonas*.
 EUROPHEN : *Butyl-cresyl iodidum*.
 EXALGIN : *Methylacetanilidum*.
 FIBROLYSIN : *Thiosinamin Sodio-Salicylas*.
 FORMAMINT : *Tablettæ Formaldehydi*, B.P.C.; *Formalin Tablets (Formitrol, etc.)*
 HELMITOL : *Formamol*
 HEROIN : *Diamorphinæ Hydrochloridum*, B.P.
 HETOL : *Sodii Cinnamas*.

GERMAN PRODUCT.

BRITISH EQUIVALENT.

ICHTHYOL : *Ichthamol* ; *Ammonii Ichthosulphonas*.

IODIPIN : *Iodatol* ; *Iodinol*.

LYSOL : *Liquor Cresol Saponatus*, B.P., resembles Lysol in properties, and there are many good brands of "British Lysol" on the market. It is usually sufficient to order as "Lysol (British)."

MEDINAL : *Sodium Mallourea*.

MESOTAN : Salicylic Methoxy-methyl ester. *Methyl Salicylas*, B.P., may be prescribed in its place.

MIGRAININ : *Antipyrinæ Caffeinæ Citras*.

POTASSIUM SALTS : Many of the potassium salts being at present manufactured in Germany, it is advisable, where possible, to prescribe the equivalent sodium salt.

PROTARGOL : *Argenti Proteinas*.

PURGEN : *Phenolphthaleinum*, B.P.

PYRAMIDON : *Amidopyrin*.

SALVARSAN : *Arsenobenzol*. Salvarsan is now being manufactured by British makers.

SANATOGEN : This is a mixture of casein and sodium glycerophosphate, and there are many good products to replace it. "British substitute" may be ordered.

SOMATOSE : *Albumose*.

STYPTICIN : *Cotarninæ Hydrochloridum*.

STYPTOL : *Cotarninæ Phthalas*.

TANNOFORM : *Methyl di-Tannin*.

TANNIGEN : *Acetannin* ; *Acidum Acetyl-tannicum*.

TRIONAL : *Methyl Sulphonal*, B.P.

UROTROPINE : *Hexamina*, B.P.

VERONAL : *Barbitonum*, B.P.

XEROFORM : *Bismuth tribromphenol*.

DIGITALIN IN "TRENCH FEET."

M. GLOVER (*Journal de Medicine et de Chirurgie*, April 10, 1915) draws attention to the value of digitalin in the treatment of the vasomotor troubles constituting the so-called "frostbite" among soldiers in the trenches. The subject attacked shows stigmata of "arthritis" and the vasomotor disturbances in the extremities are accompanied by oliguria, hypothermia and sluggishness of internal oxidation. The pulse and respiration are variable in frequency and quality.

These complications can be ameliorated if during the application of local treatment, small doses of digitalin are adminis-

tered as soon as possible. Two to five drops of a 1/1000 solution of crystallised digitalin (equal to 1/12th or 1/10th of a milligram) are administered every day. The dose is progressively diminished to vanishing point.

By its cardiomotor action and by its action on the peripheral vasomotors, a diuresis is set up and nutrition of the tissues of the limbs is favourably influenced.

THE TREATMENT OF SEPTIC WOUNDS.

M. LEMATTE advocates the use of turpentine in the treatment of septic wounds. Its action depends on its well-known leucocytogenic and antiseptic powers. The solutions employed are :—

SOLUTION A.—FUCHSINATED TEREBINTH.

Fuschine	...	...	...	0·10	gramme.
Essence of Terebinth			...	10·00	grammes.
Alcohol 95 per cent.	...	...	...	10·00	,,
Ether	...	...	...	10·00	,,

It is unnecessary to employ chemically pure turpentine.

SOLUTION B.—TEREBINTHINATED SERUM.

Chloride of sodium	...	...	8	grammes.
Triturate in a mortar and add—				
Essence of terebinth	...	...	1·50	,,
and add gradually—				

Boiled water	...	...	1	litre
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Stir for several hours and filter through a wet filter to remove the slight excess of the essence.

METHOD OF APPLICATION.

The wound is cleansed of foreign bodies as far as possible, and for fifteen minutes a compress soaked in undiluted 12 volumes oxygenated water is applied. It is then bathed in

Oxygenated water 12 volumes	}	equal parts
Terebinated serum		

Dry with sterilised gauze pads and remove all dead tissues with scissors and forceps.

Then freely paint the wound with a swab of cotton wool or brush (steeped in tincture of iodine) with Solution A., rubbing gently to enable the solution to penetrate all the infected tissues. Allow the wound to dry for some minutes and then cover it with a compress of sterilised wool soaked in Solution B. fixed on with a gauze bandage. Renew the dressing daily with the following modifications :—Next day the necrosed tissues will be coloured violet red—they must be removed with scissors. The healthy tissues are vascularised, the others are a pale rose colour. Irrigate with Solution B. ; dry with sterilised swabs. Only the wounds which have a pale rose colour are painted with Solution A. At the third or fourth dressing all suppuration will have ceased, the tissues are blood red. The painting with liquid A. is now discontinued, but the dressing with the serum is continued. If the cellular proliferation becomes arrested, the application of Solution A. is repeated on the pallid areas.

Much more rapid results are obtained by this method than the usual methods of treatment.

The cicatrising and antiseptic action of Solution A. is far superior to that of tincture of iodine. Its price is insignificant.

For all dressings and irrigations isotonic terebinthinated serum is preferable to boiled water, which is easily infected and hypotonic and thereby impedes cellular proliferation. In fistulous wounds a gauze drain soaked in Solution A. is used. The staining of the skin and linen produced by its use can be removed by a solution of perchloride of mercury (1 : 1000).

ANÆSTHESIA OF THE TRIGEMINAL NERVE BY INHALATION OF THE OLEUM SINAPIS.

L. FRODQUIST (*Svenska Läkaresällskapets Förhandlingar*, vol. xii. p. 487).—Hitherto no satisfactory local anæsthetic has been found for pain in the nose, ears, and neck. Paracentesis of the tympanum, for example, cannot be affected without discomfort and pain unless a general anæsthetic is given. None of the local anæsthetics commonly used is satisfactory ; loss of time, injury to the tympanum and imperfect anæsthesia are

considerations which baffle the surgeon who attempts this operation with the local anæsthetics at his disposal. Again, there is no satisfactory remedy for the dysphagia accompanying a sore throat. In February, 1914, A. E. Schwarz described at the Austrian Otological Society the action of oleum sinapis when inhaled by the subjects of inflammatory conditions of the nose, mouth, throat, and ears. The writer has tested this treatment and confirms Schwarz's observations.

A bottle containing a few cubic centimetres of oleum sinapis is held to the nose of a patient whose eyes are closed. He compresses one nostril and sniffs at the bottle with the other, which is, of course, on the same side of the body as the disease. When the disease is bilateral, the patient takes alternative sniffs with each nostril, and he does not desist till the inhalation has provoked a violent attack of coughing. A patient suffering from toothache, due either to pulpitis or periostitis, finds the pain vanish as soon as he inhales the mustard oil, and the anæsthesia thus induced lasts for several hours. This was invariably the case among the twenty patients treated for toothache. Schwarz concluded that the mustard oil caused anæsthesia by reflex action on the trigeminal nerve. He anticipated that pain in other organs supplied by sensory fibres from the trigeminal, would be similarly relieved or banished. On the ear alone he made forty-four observations which show that in the various forms of earache inhalation of oleum sinapis is strikingly effective. He classifies his experiments on the ear as follows:—

(1) Acute otitis. In nineteen cases he performed paracentesis of the tympanum, previously rendered completely anæsthetic by the inhalation. The writer confirms this observation. He has produced such complete anæsthesia that children have not stirred during the operation.

(2) Diseases of the external ear, including otitis externa, furunculosis, eczema, and perichondritis. In nine cases Schwarz induced anæsthesia by the inhalation, but in one case of furunculosis slight pain was felt on incision. The writer

finds that the anaesthesia thus induced in this class of case is not always reliable.

(3) Pure otalgia. In four cases Schwarz found the inhalation invariably satisfactory.

(4) Tinnitus. In seven cases the results were satisfactory. Schwarz admits, however, that the inhalation has no effect on the tinnitus of otosclerosis. The writer confirms his positive results in other forms of tinnitus.

(5) Pain following operations on the mastoid process. In five cases the results were positive.

Schwarz and Kofler have investigated the action of the inhalation on twenty-seven cases of disease of the nose and throat. In four cases of tonsillectomy the subsequent pain and dysphagia were banished for one to eight hours. In three cases of angina phlegmonosa the inhalation banished the pain and dysphagia, and rendered incision and evacuation of pus painless. The writer has had the same experience in several cases. Schwarz has had equally satisfactory results in several cases of angina lacunaris, violent pain, dysphagia, and tingling about the ears, disappearing for several hours. Good results were also obtained in headache due to empyema of the accessory sinuses. In a case of cancer of the tonsil, associated with violent pain and dysphagia, complete relief was obtained for an hour and a half. In the one case of trigeminal neuralgia the inhalation was a complete failure. Schwarz suggests that the reflex in this case may have been broken by disease in the ganglion cells or in some other section of the trigeminal nerve. The writer has treated a case of paræsthesia linguæ which had been refractory to energetic treatment by many physicians. Every discomfort vanished at the first inhalation; this effort lasted two days, and the subsequent discomfort was much less than it had been. With repeated inhalations the symptoms gradually disappeared, and the painless intervals became progressively longer. Schwarz has also tested the treatment in a case of tuberculosis of the larynx, associated with dysphagia. The result was very good, the patient being able to take solid

food, of which he had been deprived for a long time. It would, therefore, seem that the reflex may be carried from the trigeminal nerve to the nucleus of the vagus.

Schwarz has been unable to induce anæsthesia by inhalation of various other pungent drugs, including ammonia, so he concludes that some constituent peculiar to oleum sinapis induces anæsthesia. He adds that megrim and the headache of syphilis also derive benefit from this treatment.—(*Polyclinic*, June, 1915.)

VERMIN IN THE TRENCHES.

In a communication to the *Lancet*, Mr. J. Langford Moore, of St. Bartholomew's Hospital, writes as follows :—

“ Since last October I have had to prepare many remedies for the destruction of body parasites, which, owing to the enforced condition of life in the trenches have severely infested our soldiers. The drugs used have been the usual ones, sassafras, eucalyptus, aniseed, and various dusting powders, which owe their efficacy in most cases to their volatility. The anti-parasitic action of mercury has long been recognised, but its method of application not being idealistic, experiments were made to devise a more suitable and cleanly method of exhibition.

“ The following has given such satisfactory results as to warrant its publication :—

R	Hydrargyri ammoniati	...	3i
	Zinci oxidi	...	3ss
	Magnesii silicatis	...	3ss
	Fiat pulvis		

“ The powder is thoroughly applied to the infested areas on a lint pad or by medium of the pepperbox arrangement suggested by Mr. J. F. Briscoe in the *Lancet* of February 20th; being non-greasy the necessity for shaving the infested part is avoided. The mercurial salt being very slowly ionised, and the astringent and dehydrating effect of the oxide of zinc inhibiting absorption, no toxic effects are produced, but an

increased localised action is obtained. The French chalk is added to increase the diffusibility of the powder on application, making it closely resemble a toilet powder. The absence of fatty acids is much appreciated by the patients, staining of the clothes being quite avoided. I have seen the powder applied to suppurating wounds infested with vermin, with the result that in two days both parasites and ova have disappeared, and the patient's mental and physical condition has been considerably improved. I have repeatedly tested the saliva and urine of patients undergoing the treatment, and have not been able to find the slightest evidence of the general absorption of the mercury; nor have I seen that painful dermatitis produced which so often follows the application of a mercurial salt; the zinc oxide probably corrects any tendency it might have to do so. I would urge the value of the powder from a prophylactic standpoint also; dusted on the vests, pants, shirts or body, it is inimical to the development not only of vermin, but other organisms to which our virile defenders are exposed."

According to Bauer (*Deutsche Medizinische Wochenschrift*, May 6th, 1915) the habitat of the clothes and body lice is not so definite as has hitherto been assumed, and he has found that clothes and body lice may infest the hairs on the body. Hence mere treatment of clothing with a simple bath and friction with some antiparasitic can exert little or no influence over nits on the pubis. The course to pursue is simple. All the precautions taken against the clothes louse should be maintained and mercurials always applied to the pubis, axillæ, etc.

Nocht and Halberkann (*Münchener Med. Wochensch.*, May 4, 1915) recommend that dischlorobenzol be placed in sacks to be worn in each trouser leg and on each side of the chest, as well as here and there amongst the bedding and clothes. This substance is very volatile and has to be renewed every three days. It is nearly odourless and inexpensive.

Kulka praises trichlorethyl as a parasiticide, but this has the objection that its odour is disagreeable and persistent.

Many volatile substances such as ammonia, chloroform and tobacco smoke have destructive power over the nits.

It is also mentioned that lice are attracted by clothing, and there is a risk in placing outer clothing on infected beds and in riding in infected railway carriages. Washable outer garments furnish no protection, for the lice readily go from these to the linen and underwear. "Louse-proof" suits have been devised and found efficient.

NOTES AND NEWS.

UNIVERSITY OF BIRMINGHAM.

IN the Faculty of Medicine the following results have been announced with regard to the examinations in June last :—

I.—*Degree of Doctor of Medicine.*

C. Walker.

II.—*Degrees of Bachelor of Medicine and Bachelor of Surgery.*

Class I. : A. P. Thomson. Class II. : Alice Muriel Evans, K. H. Gill, E. Underhill.

III.—*Fourth Examination for the Degrees of M.B., Ch.B.*

Forensic Medicine, Toxicology, Public Health, and Therapeutics.—Class I. : F. Newey, B. T. Rose, S. T. Steward. Class II. : E. G. Alldridge, G. C. Hartley, O. C. L. Hughes, R. B. Price, Mabel Eliza Prosser, C. Rudd, Hilda Nora Shufflebotham, A. C. Smith, R. J. Staley, D. F. Standing.

Passed in Part of the Examination.—E. E. R. Spurway (forensic medicine and toxicology and hygiene).

IV.—*Third Examination for the Degrees of M.B., Ch.B.*

Pathology and Bacteriology, and Materia Medica and Practical Pharmacy.—Class II. : E. B. Ash, Olive Octavia Hooper, H. G. V. Mence, J. J. A. Scott, Carrie Sims, Hilda Walker.

V.—*Second Examination for the Degrees of M.B., Ch.B.*

Anatomy and Physiology.—Class I. : E. G. T. Holden.
Class II. : Alice Margaret Chinn, Mary Dorothea Gilson, H. A. Hill, F. W. M. Lamb, A. W. Lloyd-Davies, D. C. Rennie, C. E. Rice, C. J. Slim, Doris Elsie Florence Stanton, Agnes Elizabeth Towers, D. V. Townshend, A. H. Turton, Margaret Aileen Williams.

VI.—*First Examination for the Degrees of M.B., Ch.B.*

Physics, Chemistry, and Biology, Internal Candidates.—
Class I. : E. N. J. Brett. Class II. : H. P. Daly, Agnes May Frew.

Passed in Part of the Examination.—C. C. Bradsworth (chemistry and biology), J. Lowe (physics and biology), F. S. Vaughan (physics and biology).

Completed the Examination.—E. Lowe (biology), T. C. McKenzie (biology), W. A. W. Parkes (biology).

External Candidates.—Class II. : H. Donovan, King Edward's High School, Birmingham.

VII.—*Third Examination for the Diploma in Dental Surgery.*

Anatomy and Physiology, and Dental Anatomy and Dental Histology.—A. C. Bloomer, A. Youngson.

VII.—*First Examination for the Diploma in Dental Surgery.*

Chemistry and Physics.—Passed in Part of the Examination : E. N. Hughes (chemistry only).

VIII.—*Examination for Diploma in Public Health.*

Part I.—Jessie Mary Valentine.

Queen's Scholarship (second year).—E. G. T. Holden.

Queen's Scholarship (fourth year).—F. Newey.

Queen's Scholarship (final year).—A. P. Thomson.

Ingleby Scholarships.—A. P. Thomson.

Russell Memorial Prize.—A. P. Thomson.

Dr. Violet Coghill has resigned the posts of Demonstrator of Anatomy and Lecturer on Hygiene to the Training College for Women.

THE UNIVERSITY AND THE WAR.

At the present time some 300 of the students and members of the teaching staff are away on active service. Many of the remaining students, including women, have volunteered for war work during the present vacation, and will be engaged for the next few months in munition, agricultural, and nursing work. The senior students in the chemistry department, under the direction of Professor Frankland, will be engaged throughout the vacation and also during the coming session in research work connected with the manufacture of high explosives for the Ministry of Munitions. Many of those who have finished their courses have joined the chemistry section of the Engineering Corps at the front.

Officers' Training Corps.

As is proper in such a time, one of the busiest departments of the University is the Officers' Training Corps. Though not confined solely to University students—cadets being admitted, at the discretion of the O.C., on the possession of matriculation or some equivalent qualification—its work is so arranged that students can attend their University courses and also fulfil their duties in the corps. Many have availed themselves of this opportunity for obtaining a thorough and extensive knowledge of army work, and since December upwards of ninety of the members have received commissions. It has been the good fortune of one of the late members, Lieutenant T. J. S. Weston, son of Dr. Darby Weston, of Handsworth, to receive the D.S.O.

Dr. T. Gwynne Maitland, after having staffed and organised a Hospital for Infectious Diseases in connection with Lady Paget's unit at Skoplje, returned to England to collect a fresh unit for the staff of a new Hospital to be established at Belgrade, and has now returned to Serbia to take charge of this Hospital.

We congratulate him on the success of his ventures and on his immunity from the prevalent scourge—typhus fever—and also on his promotion to the rank of Colonel in the Serbian army and the decoration of the Order of The White Eagle.

ROYAL ARMY MEDICAL CORPS.

The following announcements have recently appeared in the *London Gazette* :—

1st Southern General Hospital—

Capt. L. P. Gamgee, F.R.C.S., to be Major (May 23).

W. Kirkpatrick, M.D., to be Major, whose services will be available on mobilisation (June 1).

T. Wilson, M.D., F.R.C.S., to be Captain, whose services will be available on mobilisation (June 1).

John Weston Stretton to be Captain, whose services will be available on mobilisation.

Aubrey Bradford, to be Lieutenant.

1st South Midland Field Ambulance—

Lieut. F. E. France, M.B., from attached to units other than medical units to be Captain (temporary) (May 27).

2nd South Midland Mounted Field Ambulance—

William Vincent Wood to be Lieutenant.

Sanitary Service —

Arthur Robert Lyster to be Captain, whose services will be available on mobilisation.

WAR CASUALTIES AMONG THE SONS OF LOCAL MEDICAL MEN.

The following sons of medical men living in the district have lost their lives in the service of their country :—

Lieutenant Henry Gordon Parkes, of the 4th Battalion of the Worcestershire Regiment, was killed in action in the Dardanelles on the 4th of June. He was the eldest son of Dr. Parkes, of Somerville Road, Sutton Coldfield, and brother of Surgeon Oscar Parkes, of the Royal Navy, who is now in charge of a Hospital Ship in the Dardanelles.

Second Lieutenant Robert Walter Lawrence Edginton, 1st Battalion 5th Royal Warwickshire Regiment (Birmingham Territorial Force), was killed in France on June 4th. He was the only son of

Dr. Edginton, 70, Portland Road, Edgbaston, and a medical student. He was reported upon most favourably for a brilliant deed on May 9th, when under a severe fire he left the trenches carrying a sandbag to aid a member of his company who had been wounded.

Lieutenant Walter Henry Fox, 2nd Bedford Regiment, was killed in action on the 16th of June. He was the elder son of Dr. G. M. Fox, of Walsall.

Lance-Corporal Eric Pollard, younger son of Dr. J. Ellery Pollard, of Acock's Green. Killed in action.

CARE OF THE DEFECTIVE : WORK OF A BIRMINGHAM ORGANISATION.

SOME interesting facts and figures are contained in the annual report of the Special Schools After-Care Sub-Committee of the Birmingham Education Committee. The Sub-Committee was first appointed by the late Birmingham School Board in 1901 to keep a record of the subsequent history of children who have left the special schools for defectives (mental and physical), and to help them to find work.

The number of children on the Committee's books (excluding those in institutions, or lost sight of) is 1,039, and the number visited is 1,026. During the year 296 new cases were brought under the control of the Committee (179 mentally defective, 12 deaf, 80 cripples, and 25 partially blind) in addition to 1,956 previously dealt with. These were all visited and kept in touch with, the information about them being carefully recorded. The After-Care Committee has, since its formation, dealt with 2,252 cases, of which the following is the summary :

Mentally defective ...	...	1,436
Deaf ...	...	163
Cripples ...	...	565
Partially blind ...	...	88

As an instance of the effective character of the work undertaken by the Sub-Committee, the fact may be mentioned

that of the 1,436 mentally defective 495 are doing remunerative work. Of these, 415 are earning wages which average 10s. 2d. per week; 279 are males, earning from 1s. 6d. to 35s. per week (average 11s. 7d.), and 136 are females, earning from 3s. to 20s. per week (average 7s. 5d.). Over fifty have joined the colours, and one has been killed in action. However, it is recorded that some of the men and women constantly lose their employment, being always the first to be dismissed when work is short, and the long spells of idleness have a deteriorating effect. Of the 163 deaf persons 77 are doing remunerative work; 55 males are earning wages varying from 5s. to 36s. per week (average 15s. 2d.), and 22 females are earning wages varying from 2s. to 10s. per week (average 6s. 8d.). Of the 565 cripples 108 are doing remunerative work; 52 males are earning wages varying from 1s. 6d. to 24s. per week (average 9s. 5d.), and 56 females are earning wages varying from 1s. to 21s. per week (average 6s. 5d.).

SPECIAL SCHOOL TEACHERS.

AN experiment of considerable importance in connection with the training of teachers for special schools where deaf and dumb, partially blind, and physically and mentally defective children are educated, is about to be conducted in Birmingham. Since the Mental Deficiency Act came into operation the need for these special schools has greatly increased, but no provision has been made for the scientific or practical training of the teachers. The Central Association for the Care of the Mentally Defective, however, have been fully alive to the need of development in this direction, and they are now making themselves responsible for a scheme which will assist in some measure in meeting requirements. The Birmingham Education Committee have placed at their disposal the whole of the special schools in the city—about a dozen in all—and pupil teachers will have practical demonstrations of the work by competent teachers. While the experiment is being conducted lectures will be given in the University by experts on mental deficiencies. Eventually, it is hoped, a national institution for the training of special teachers will be established.

THE OUT-PATIENT PROBLEM AT WOLVERHAMPTON.

THE shortage of doctors at Wolverhampton led, early in May, to the closing of the out-patient department at the General Hospital, so far as medical cases were concerned. At a meeting of the Hospital Saturday Committee, however, Mr. W. H. Harper, the hospital secretary, announced that, as a result of several meetings and conferences with the medical staff, it was recommended that the department be re-opened. A stipulation is, however, that only those patients will be seen who have been recommended by a medical practitioner. A hospital note, as usual, will have to be produced. Mr. Harper explained that this was the best that the hospital could do, and that the present arrangement was made because the Board's wish that the department should be open on the old conditions had been found impracticable. The Saturday Committee welcomed the proposal, and expressed their gratitude for the work performed by the depleted medical staff, who, it will be realised, are now responsible for their own work, that of their colleagues absent on active service, and the hospital's also.

SOLDIERS' DIET IN THE COVENTRY HOSPITAL.

A LETTER in the local newspaper appealing for vegetables on behalf of the Coventry and Warwickshire Hospital was made the subject of discussion at the monthly meeting. Mr. H. H. Ilett asked if this letter was the outcome of a conversation he had had with the Chairman, Mr. W. G. Wormwell, in which he remarked that the soldiers complained of a lack of green vegetables. The speaker added that it was most important that it should not be asserted that the diet for the wounded in Coventry Hospital compared unfavourably with that in the military hospital. He asked if the addition of green vegetables was to rest on the response to the Chairman's appeal. It seemed odd that the soldiers could get plenty of butchers' meat, which was so dear, and could not get green vegetables, which, he believed, were cheap. The Chairman replied that the dietary was always before the management. The present matron had introduced considerable reforms in the dietary from the

patients' point of view, by which the whole hospital was affected. They had 160 patients, and the matter was not so simple as Mr. Ilett thought. According to a recent resolution, of which Mr. Ilett seemed unaware, the soldiers are having green vegetables three times a week. The Chairman added that in a sense they were experimenting. They would try vegetables three times a week, hence their appeal to the public to help them in the trial. The implication of this discussion is that vegetables even three times a week is something of an innovation. The just inference is that the present dietary scale at this hospital is seriously defective.—(*The Hospital*, June 26, 1915.)

BOOK REVIEWS.

Radiography, X-Ray Therapeutics, and Radium Therapy. By ROBERT KNOX, M.D. (Edin.), M.R.C.S., L.R.C.P. (Lond.). London: A. and C. Black, Ltd. Price 25s. net.

THE diagnostic value of radiography in injuries and many diseases is incontrovertible, and an X-ray installation is considered an essential part of the equipment of every modern hospital. Unfortunately, the tendency to extreme specialisation in the subject has caused the average student and practitioner to be somewhat negligent in acquiring a working knowledge of the subject, and to entrust to the expert the more technical photographic and screen work as well as the interpretation of the results obtained.

In large educational centres the average practitioner may well be allowed to dispense with the management of the apparatus, but it is an essential part of the clinician's duties to examine the results on plate and screen for himself and carefully to compare them with those of his clinical and maybe his pathological observations, so as to make his diagnosis as exact as possible.

The publication of this treatise will do much to direct the attention of the profession to the necessity for each practitioner to know enough about radiography and radioscopy to interpret the results obtained. The work is essentially practical in character, but the description of the apparatus and its practical working is given in sufficiently detailed and simple language so that those who are least mechanically inclined will be enabled to follow the methods employed. From more elementary matters the author takes the reader to more complex matters such as localisation, installations in hospitals and for military service. Even the special photographic technique required in the production of a perfect radiograph has not been overlooked.

The major portion of the book is taken up with the practical uses of X-rays and radium in the diagnosis and treatment of injuries and diseases which are detailed in anatomical order. In this part of the work numerous and well-executed radiographs are reproduced on special plates in negative and positive. The result is decidedly effective, and although the positive is not always preferable, it appears that in almost all cases the one seems to supplement the other and render the reading more complete and exact.

The section on Radiotherapeutics is very practical and exhaustive. The subject is not yet sufficiently well established that anyone can speak without some reserve as to its value in all cases. We are glad to find that the author makes no claim to its universal usefulness in disease. The introductory chapter to the section on radiation therapeutics is highly instructive, and should be studied by everyone who intends to submit his patients to this form of treatment. Should the practitioner propose to apply the treatment himself this section will form a complete guide to him both as to equipment and proceeding, whether he proposes to use X-rays or radium or both, with or without supplementary methods.

A special chapter on the Physics of Radium, from the pen of C. E. S. Phillips, has been included, and forms a valuable introduction to this somewhat obscure subject.

The therapeutical side of the question is treated in a well-balanced and restrained manner, and is worthy of the serious consideration of medical men. It is evident that in certain cases, and with judicious application, it has a field of considerable usefulness, but the author warns us not to bring a valuable therapeutic measure into disrepute by indiscriminate use.

A glossary is appended, and will be found handy by students and beginners.

The publishers' work, both as to printing, paper, illustrating and binding, is highly creditable, and the volume forms a signal and worthy addition to the "Edinburgh Medical Series."

Lead Poisoning, from the Industrial, Medical, and Social Point of View. By SIR THOMAS OLIVER, M.A., M.D., F.R.C.P., Consulting Physician, Royal Victoria Infirmary, and Professor of Medicine, University of Durham. London: H. K. Lewis. 1914. Pp. 294. Price 5s. net.

THIS book contains the lectures delivered in the Royal Institute of Public Health. No metal is more widely used in the arts and manufactures than lead, and the harm done by it exceeds that of any other substance used in commerce. The author sets forth the methods by which lead enters the body, the effects it produces, and how these effects may be got rid of. The first portion of the book contains an interesting account of the various lead industries, such as lead smelting, manufacture of red and white lead, china and earthenware, paints, printing and typefoundry, and so on, and their influence upon the health of those engaged in them. Then follows an account of the symptoms and the preventive and curative treatment. The effect of lead poisoning upon the race is shown by the statement that of 36 women formerly white lead workers, the following are the results of their 294 pregnancies—51 miscarriages, 16 still births, 104 infants died shortly after birth, and 17 within a few years of birth. The work is of considerable value to practitioners in our industrial district.

Atmospheric Air in Relation to Tuberculosis. By GUY HINSDALE, A.M., M.D., Hot Springs, Virginia, Secretary of the American Climatological Association, etc. Published by the Smithsonian Institution, Washington, 1914. Pp. 136.

THIS essay won the prize offered by the Smithsonian Institution in connection with the International Congress of Tuberculosis, 1908. It gives a very full account of our knowledge of the relation of atmospheric air and climate with tuberculosis. It is impossible to dissociate the relation of air to tuberculosis from the influence of such other factors as sunlight, heat, rainfall, etc., which all receive due consideration. There is a critical discussion on the influence of micro-organisms, organic impurities, ozone, carbon dioxide, and smoke, and the author agrees with Leonard Hill and others that the chief factor causing discomfort in badly-ventilated rooms is heat stagnation. Much of the book is concerned with the influence of various climates and the methods adopted in the open-air treatment of tuberculosis, and it contains numerous photographs of open-air devices. Much labour has been spent on the preparation of this essay, which is a very valuable contribution to the subject of climatology.

Medical Nursing. By A. S. WOODWARD, M.D., B.S., M.R.C.P. (Lond.). London: Edward Arnold. Price 4s. 6d. net.

In a little over 300 pages the author of this book covers a wide field of interesting subjects, most of which more or less concern the nurse in her professional capacity. The first fifty pages are concerned with the general principles of nursing and the administration and action of medicines, and the application of various remedial measures. Then follow brief accounts of various diseases, as they affect the various systems, and their treatment, special emphasiss being given to the nurse's duties in each case.

Special chapters are devoted to the Nursing of the Insane, the Nursing of Sick Children, Massage, and Invalid Cookery.

A chapter on the Care of the Dead and on the making of dying declarations and wills, and sections on massage and invalid cookery are also included.

The author has foreseen that the scope of the work might be considered excessive, and that it might be regarded as a minor textbook of medicine, and explains that this line has been taken "in the hope that the manual may be of service to the practitioner of medicine, in reminding him of the details which he will be obliged to discuss with the nurse, the warnings he will have to utter, and the orders he will be expected to give." Even so, we think that the "nursing" portion of the work might be extended at the expense of the "medical textbook" sections, as the latter are inadequate for the practitioner and need not be so detailed for the nurses. There is no particular reason why chapters on special nursing should be limited to that of the insane and sick children, but, if such are included at all in the work, eye, ear, nose, throat, and gynæcology should also be dealt with.

The work is pleasantly written, the information is sound, and the book can be thoroughly recommended as a safe and useful guide to nursing, or may even be of considerable assistance to the practitioner who has much to do and not enough time to do it in.

Husband's Pocket Prescriber and Guide to Prescription Writing. Revised in accordance with the British Pharmacopœia, 1914. By DAVID MITCHELL MACDONALD, M.D. Fifth edition. Edinburgh: E. & S. Livingstone. 1915. Price 1s. 6d. net.

IN consequence of the drastic changes in the British Pharmacopœia of 1914, the revision of this useful pocket prescriber has led to an exceptional amount of alterations and additions. The important changes in old remedies effected by the New Pharmacopœia are briefly summarised, and their composition and strength compared with those of the previous issue. The new remedies included and new names for preparations hitherto regarded as proprietary are also mentioned.

The general arrangement of the prescriptions—according to diseases or symptoms—remains the same, but wherever possible they are written both in the Imperial and metric forms.

The prescriptions given are well chosen, and most of them have stood the test of time, whilst others, such as salvarsan, have justified their inclusion by their immediate success and almost universal adoption in the treatment of specific diseases.

This little volume should prove of great convenience and practical utility to the busy practitioner.

The Vaccination Question in the Light of Modern Experience.
An Appeal for Reconsideration. By C. KILLICK MILLARD,
M.D., D.Sc., Medical Officer of Health for Leicester, etc.
London: H. K. Lewis. Pp. 243. Price 6s. net.

MOST medical men hold very strong opinions upon vaccination, and regard the question as having been decided once and for all. To such we recommend Dr. Millard's book as deserving serious consideration. Whilst fully accepting the protective influence of vaccination upon the individual, he believes that there is room for further consideration as regards its effect upon the community. He believes that vaccination and re-vaccination of the whole population would stamp out smallpox, but recognises that compulsory powers to bring this about could not become law. Taking the law as it stands at present, he asks whether infant vaccination as carried out in this country is worth while, and whether it does not encourage the spread of smallpox by so modifying cases as to make them almost impossible of recognition. There is no doubt that many epidemics have originated in an unrecognised case in a vaccinated person. Whilst he would abandon infant vaccination, he regards emergency vaccination as an infallible weapon in fighting smallpox. Provided only that the first case is promptly recognised, it enables us almost with certainty to prevent the infection from spreading. He thinks that there is evidence that smallpox is leaving this country in spite of the

neglect of vaccination. Until infant vaccination is abolished, he advises the re-vaccination of children at school age, as this would lessen the danger of modified cases. To summarise the author's position as we understand it : Three courses are open to us—(1) To vaccinate and re-vaccinate the whole community ; (2) to carry out infant vaccination inefficiently as at present ; (3) to abandon infant vaccination, and to rely upon vaccination of all contacts with a smallpox case. The first course, whilst it would stamp out the disease, is impracticable ; the second, whilst giving a large measure of individual protection, actually allows the disease to become epidemic by so modifying cases that they cannot be recognised, and therefore spread the infection. The third course, which is the one advocated, would allow smallpox cases to be immediately recognised, as they would not be modified by previous vaccination, and at the same time its epidemic appearance would be prevented by the prompt action of the public health authorities. Dr. Millard presents his case with a wealth of argument and in a logical manner entirely free from prejudice. We are glad that he has published his book, as there has been some tendency to stifle discussion on the subject.

Cane Sugar and Heart Disease. By ARTHUR GOULSTON, M.A., M.D., Hunterian Society's Medallist, 1912. London : Baillière, Tindall and Co. 1914. Pages 107. Price 5s. net.

THIS is a plea for the use of cane sugar in the treatment of cases with failure of the heart muscle. There is experimental evidence and a sound physiological basis for the author's contention. He insists that the sugar must be a cane sugar, and not beet sugar. The latter fails to produce the same effect, and it is suggested that there is an activator present in cane sugar and absent in beet sugar. It is well known that the syrup used for feeding bees in winter must be made with cane sugar, as the bees deteriorate and contract disease when fed on beet sugar. The author begins with 2 ounces daily for the first

week, increasing to 3 ounces daily the second week, and to 4 ounces the third week. This last amount is maintained as long as necessary. It is given dissolved in water every two hours, or with other food. Glycosuria has not been found as a result of the treatment.

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HEMIANOPIA, OPTIC APHASIA AND ALEXIA FOLLOWING POST-PARTUM HÆMORRHAGE.

C. BRACEY DALE, M.R.C.S., L.R.C.P.

THE following case appears to be worthy of notice, both on account of its rarity and of the nature of the lesion, which was sufficiently defined that it may throw some light on the vexed question of subcortical sensory aphasia.

Mrs. S., aged 36 years, was delivered of her second child on April 28th, 1915. The labour was rapid and the child was born before my arrival. The placenta was delivered without difficulty, and the hæmorrhage was moderate. The patient was left as she was apparently doing well, though the pulse was slightly above normal.

Two hours later the patient was seen again, having had a fairly sharp hæmorrhage, which, however, had ceased by the time I arrived. She was collapsed and complained of intense pain in the head. A saline injection per rectum was administered. When seen later in the day the general condition had improved but the pulse was 140 and she complained of pain in the head and of not being able to see properly. On the following day it was found that she had right-sided hemianopia. The pupil reactions were normal. The pulse was still 140, and the severe pain in the head persisted. It was noticed also that her thyroid gland, which had previously been promi-

ment, was more enlarged. This increase in size persisted for some days and was associated with marked pulsation in the neck and a loud systolic bruit over the aortic area. There was no exophthalmos but there was a suggestion of Von Graefe's sign. She had mitral stenosis, but the heart was well compensated. She had an appendicectomy before her first pregnancy.

Cerebral Symptoms.—As her condition improved a more thorough examination of her cerebral symptoms was possible. It was then found that in addition to the right-sided hemianopia she was unable to name familiar objects, though she knew what they were for and for what they were used. She also suffered from alexia but was able to say what a word was when spelt to her. She also succeeded in recognising the letters of “tea” separately and ultimately found the word. Shown the word “ring” she could only recognise the “i.” When told to write the word in printed letters she copied “R” correctly, “i” in writing, converted “n” into “m” and had “g” correct. She could write a sentence clearly and correctly, but could not read it afterwards, saying that it looked to her “all wrong,” though she remembered what she had written. There was some slight defect of memory, as she thought her elder child was two years of age, whereas he was only one year old. Her mind was otherwise quite clear, and her intelligence normal.

There was no paresis of face, arm, or leg. Tendon jerks were normal and the plantar reflex was flexor. She remained in this condition for a month, when her temperature went up and she developed pelvic thrombosis and a few days later thrombosis in the left femoral vein.

Six weeks later her temperature was normal. Pulse 100. Thyroid about the same size as it was before her confinement. Pelvic and femoral thrombosis clearing up. Complete right homonymous hemianopia. Central visual acuity and pupil reflexes normal. No loss of memory either of events or names. She was able to read a little by painfully spelling out the words letter by letter.

Remarks.—Leaving out the temporary and slight impairment of memory we have in this case the following salient symptoms :—

- (1) Right homonymous hemianopia.
- (2) Pure word- and letter-blindness.
- (3) Object blindness—in so far that the objects could be recognised but not named.
- (4) Alexia, but no agraphia.

It must be assumed that the same lesion accounts for all the symptoms and there seems little doubt but that the lesion here is a thrombosis of the left posterior cerebral artery. Such a lesion would result in loss of function of the left occipital cortex, thus accounting for the hemianopia, but plugging of the posterior cerebral artery would not cause a lesion of the left angular and neighbouring gyri forming the visuo-psychic areas, which are supplied by the middle cerebral artery. It would appear, therefore, that the word-blindness is of that form which has been designated pure word-blindness, which is dependent on a lesion of the tracts which enter the cortical centre for word-seeing from the primary visual centres. This lesion would be subcortical and would naturally result from the primary lesion assumed, viz., thrombosis of the posterior cerebral artery.

It would appear from the history of the progress of our case that the cortical lesion is of a more permanent character than that of the association fibres connecting the occipital cortex with the higher visual centres, since the hemianopia has shown no tendency to improvement, while the word-blindness has largely disappeared.

NOTES ON MILITARY SURGERY.

By G. W. CRILE.

At the outbreak of the present war the American colony in Paris started a hospital of 450 beds at Neuilly, a suburb of Paris. A new building recently erected for high school purposes was pressed into service. The institution was found to be well organised, with excellent nursing. The service of the Western Reserve unit embraced 150 beds. These were kept filled continually. The intake of new patients per day varied from 10 to 30, the maximum being 39.

The principal advances in military surgery, as noted in the data furnished by the present war, are the absence of typhoid and tetanus among the soldiers, due to the routine practice of administering antiserums. No cases of tetanus were seen by the party. However, when the warm weather comes tetanus may be found to begin its onslaughts, due to the breaking of the ground in which the tetanus bacilli are known to abound. If the disease still remains in abeyance at that time the credit then must be given to the tetanic antiserum.

The chief problems of military surgery are, perhaps, shock and infection. All of the wounds seen by the party were infected. Asepsis and antisepsis have broken down and failed in their strenuous trial in the present war. Iodin, bichlorid, phenol, and the remainder of the long list of approved antiseptics have been found to be of negative value.

The soil of France and Belgium has been under cultivation for centuries, and has been treated with enormous quantities of fertiliser. The result is that the ground is laden with germs. In the trenches the troops become covered with dirt and germs on their bodies and clothes. Shrapnel shot and shell carry the dirty cloth into the wounds, so that there is a constant source of infection.

Gas gangrene, due to infection with the gas bacillus, is especially common, and great numbers of cases were seen. The infection starts and progresses with astonishing rapidity, there is enormous swelling, moist gangrene sets in, and the patient usually dies in from one day to a week. The odour from such infections is terrible. Devitalised tissue is especially liable to infection by the gas bacillus. The treatment has been to clean out the foreign bodies in the wound and then to cut away the necrotic tissue.

The progress made in military surgery relative to the treatment of infections since the time of the Franco-Prussian war is practically nil. Present authorities have come to the conclusion that the use of antiseptics in infections at the front is of no value. If an efficient antiseptic were available it would be of inestimable value. For the purpose of discovering such an antiseptic, if possible, Alexis Carrel has recently abandoned active service in the field, and is devoting his time to research.

The inefficiency of the dry dressing has also been demonstrated in the present war. It acts merely as a pus poultice. It has been found that wounds do best either with a moist dressing or when the part is immersed en masse in Wright's solution. The wounds also heal extremely well in sunlight or electric light. An interesting experiment was carried on in the hospital to prove, if possible, the relative efficacy of dry and moist dressing as compared with the open treatment of wounds where no dressings were used. Half of the patients had their wounds treated with moist or dry dressing, while the other half had no dressing at all applied to their wounds. It was found that the wounds treated in the latter way healed much more readily than those where moist or dry dressings were applied.

Wounds of the head abounded among the patients treated. This fact is the expected sequel of trench warfare. Treatment of such cases was found to be extremely unsatisfactory on account of the accompanying infection. The infected brain has small power of recovery, or if recovery does occur the patient subsequently suffers from epilepsy or other complication.

Wounds of the jaws and mouth also abound, and for the same reason as wounds of the head. Practically all of these cases were turned over to the dentists of the hospital for treatment, and the results obtained were extremely satisfactory. Similar procedure might be adopted more extensively in civil practice with advantage.

Penetrating wounds of the chest, in which the bullet went entirely through both sides, did well, healing entirely in from one week to ten days. However, these cases often developed pleurisy with effusion. There was no suppuration, however. Brewers tubes were used in these cases, and worked very well.

Results in abdominal surgery were not so encouraging. All of the penetrating wounds of the abdomen did badly, most of the patients dying. These cases progressed more favourably, however, when instead of being operated, they were treated as cases of peritonitis from the start, large doses of morphin being given.

In the case of wounds of the genito-urinary organs it was found that wounds of the ureters and bladder did poorly. Most of the patients arrived after great swelling and extravasation had taken place.

Wounds of the arms and legs, in many of which the bones were badly shattered, did poorly. The patients with shattered bones of the upper thigh could not be moved decently, and in many cases received no treatment for days. Most of them in the early days of the war died. The practice now is, however, to amputate such cases at the first base hospital. In civil practice, in dealing with cases of this nature, one can decide upon the method of choice in treatment, and has every facility for carrying it out. In military surgery, however, it is different, so that these cases present many perplexing problems.

Wounds of the shoulder joint assumed importance because of the frequent concomitant injury to the brachial plexus. In a number of cases the nerve trunks were merely grazed by the balls. This produced, however, an effective though temporary paralysis, and it is interesting to note that the same principle was made use of in shooting wild horses in the west, to capture

them, in the early days of this country. It is of extreme importance that injuries to nerves be looked for and found in suspicious cases.

Bone plating was not done, for the reasons that facilities for carrying out the measure in an ideal way were not at hand, and also because in a number of the cases the bones were found to be too badly shattered. However, it was found that in the case of compound infected fractures non-union very rarely occurred. The same is known to be true in civil practice.

Many false aneurisms of traumatic origin were encountered. More than 30 main trunks were ligated for aneurism, and only rarely did gangrene follow. True aneurisms will probably occur later. It will take about a year for these to develop.

In the operations on nerves it was found advantageous, after the ends had been re-united, to place about the line of junction a fat-fascia flap, the fat being next to the nerve itself. Fat is a non-conductor, and the good results obtained by this method may be due to this fact.

Secondary hæorrhage was observed in a number of cases. Transfusion is extensively practised in the French army.

No work was done on transplantation of limbs, because it was impossible to maintain sufficient asepsis for carrying out this work.

Shock and exhaustion really represent the great injuries of the war. These affect alike the soldier in the field and his friends and relatives at home. Many of the soldiers became insane at the first impact of struggle. The greatest strain came at that time, with the result that the susceptible succumbed.—*Cleveland Medical Journal*.

ABSTRACTS.

ASPHYXIATING GASES IN WAR.

NOTWITHSTANDING the fact that the asphyxiating gases used by the Germans during this war have been carefully studied both as to the chemical and physical qualities, and the clinical effects and pathological lesions produced in the victims, there appears to be some uncertainty as to the exact nature of the gas employed. This is probably due to the fact that the perfidious Teuton does not limit himself to the employment of one or two poisonous gases, but is as expert in the selection of potent poisons as he is in the methods of their application. Proofs of these deep-laid poisoning schemes are given in a recent book called "The Poison War," by A. A. Roberts,* who deals with the whole question of the inhuman German usage of all sorts of poisons in this war. As to the gases employed, the author states that at least three gases have been made use of, viz., chlorine, bromine, and nitric peroxide. It is possible that carbon monoxide has also been utilised. These they naturally employ according to the military exigencies of the moment, and the facilities for obtaining the requisite amount of gas. This then accounts for the varied speculations as to the nature of the toxic gas, and indicates the necessity of endeavouring to find out the probable character of the fumes in each particular case, so that suitable antidotes might be applied. Of course it is also possible that a mixture of gases may be used, and this would add to the difficulty of estimating the nature of the fumes, and modify and complicate the character of the clinical symptoms and pathological changes.

Nitric peroxide ($\text{NO}_2 : \text{N}_2 \text{O}_4$), according to Luff and Candy, is a reddish brown vapour, with a strong odour and unpleasant acid taste. It is non-combustible, and undergoes no change

* "The Poison War," by A. A. Roberts. London : William Heinemann.

when brought into contact with the air. It is heavier than air, and dissolves readily in water, producing a mixture of nitrous and nitric acids in the cold. With hot water only nitric acid appears to persist. Similarly when passed into a solution of an alkali or of an alkaline carbonate it will form a mixture of a nitrite and a nitrate of the alkali metal. It is prepared by several methods, *e.g.*, by heating of nitrate of lead. "It causes a remarkable condition of asphyxiation, which may or may not be temporary. The trouble is that the real effects of nitric peroxide may only become apparent some hours after inhalation. Cases have many times been recorded of men who having inhaled the fumes were deemed to have almost recovered from the effects. Nevertheless they succumbed that night, or in some cases upon the following day. Apart from chemical reasons this delay in the appearance of symptoms has been regarded as a disadvantage in the use of nitric peroxide" (Roberts).

Chlorine is two and a half times heavier than air. It has a greenish-yellow colour, a very unpleasant suffocating odour, and a disagreeable taste. It is non-combustible in air, but it will cause the combustion of many bodies, such as turpentine, phosphorus, and powdered antimony. It is soluble in water. It bleaches all vegetable colours in the presence of moisture. Propelled by the poison gas apparatus such as the Germans employ, and with a favourable and not too violent wind, this gas would travel along the ground for a considerable distance. It is easily prepared in large quantities, particularly by the Germans, to whom the "Carnallite" salt beds of Stassfurt are available. Reduced to a liquid under pressure at a low temperature, it is carried by the Germans in strong steel cylinders with stopcocks ready for use. When the tap is opened the liquid is forced out, and becomes reconverted into gas upon contact with the air, and rolls along the ground. The effects upon the troops would vary according to the percentage of the poison inhaled. At very close range it would be almost undiluted, and would set up very severe symptoms. At longer range or in the event of heavy rain (owing to its solubility in water) the effects would be mitigated.

Bromine is a heavy dark red-brown liquid, which, however, is very volatile, forming a reddish-brown vapour, possessing a disagreeable odour, more intense than but like that of chlorine. It is soluble to a certain extent in water. It is poisonous and extremely irritating to the mucous membranes of the eye, nose, and respiratory passages. In contact with the skin it may produce painful sores.

It is produced in Germany as a bye-product from the Stassfurt salts. The two important producers of chlorine and bromine in Germany are the Badische Anilin and Soda Fabrik, of Ludwigshafen, and the Chemische Fabrik Greisheim Elektron, of Frankfurt-on-Main. Even prior to the declaration of war the staffs of these establishments had undergone enormous increase, in spite of the fact that the prevailing normal trade conditions did not warrant the change. At the present time the number of employes is said to have been more than doubled. No tangible reason has ever been given by the authorities for the adoption of these steps" (Roberts).

Carbon monoxide is a colourless, almost odourless and tasteless gas. It is combustible, but a non-supporter of combustion. It is slightly lighter than air, and insoluble in water, but is readily dissolved by a solution of cuprous chloride in dilute hydrochloric acid. It is produced by a number of methods, such as burning charcoal with a deficiency of air; in the manufacture of acetone, and in the Leblanc soda process.

It is poisonous owing to its property of displacing the oxygen from its union with the hæmoglobin of the blood forming a compound with the hæmoglobin, which acts as a narcotic poison. An atmosphere containing 0.2 per cent. of CO renders a man helpless and unconscious in about half an hour. Carbon monoxide hæmoglobin has a pinkish red colour, and since after death it does not give up its CO and become changed into purple hæmoglobin, the bodies of those poisoned by the gas retain the florid colour of life.

Remarkable cases of CO poisoning have been recorded. Unconsciousness may last for some days, to be followed by

temporary and partial recovery, with aphasia and later mental failure. Loss of memory seems to be not an uncommon symptom, and the cases of loss of memory and other curious mental symptoms following shell shock may arise from the development of carbon monoxide by the bursting of artillery shells.

Sulphur dioxide. This familiar gas is highly poisonous and asphyxiating. When pure it is transparent and colourless, with a very pungent odour and acid taste, and is very irritating to the eyes and respiratory passages, setting up an acute bronchitis, owing to its corrosive properties. "Troops engaged in the projection of this gas upon a large scale would doubtless be provided with smoke helmets" (Roberts). It is more than twice as heavy as air, and is freely soluble in water, and is readily absorbed by camphor and glacial acetic acid. Cooled by means of a freezing mixture, the gas condenses to a liquid. It bleaches moist vegetable colours indirectly by reduction.

It is easily and inexpensively prepared by the combustion of sulphur in air. It is also cheaply prepared by the action of strong sulphuric acid with heat on charcoal and carbonaceous matter generally. By this method carbon dioxide is produced at the same time, but for the diabolical purposes of the enemy this would not, at any rate, be considered a disadvantage.

It would appear that sulphur dioxide was the first asphyxiating gas experimented with by the Germans, who stated that "this gas acts as an irritant on the lungs and eyes, and is thus adapted to incapacitate the enemy, but it is not poisonous, so that its employment in warfare is not contrary to international law." (Roberts' "Poison War," p. 27.)

DR. MURRAY LESLIE, in an address delivered at the Institute of Hygiene, said there had been considerable speculation as to the exact nature of the asphyxiating gases used. Professor J. S. Haldane, our greatest scientific expert on the physiology of respiration in poisonous conditions, pronounces in favour of chlorine or bromine. It may be taken also as generally accepted that the greater part of the volume of the gas is chlorine, but

that it sometimes contains bromine, sometimes anhydrous sulphur oxides, and possibly impure nitrogen oxides, especially tetra-oxide of nitrogen, one or more of which may have specific poisonous property.

The gas is evolved in some special apparatus and projected from a tube towards the trenches of the Allies when the wind is blowing in the right direction. It appears in the form of a yellowish-brown smoke, which floats slowly along close to the ground, and is readily visible for a considerable distance. Sir John French's report, dated May 25th, states that the gas cloud rose in places 40 feet high, and that over a front of five miles the gas was emitted from cylinders throughout a period of $4\frac{1}{2}$ hours.

All the men had respirators, but not all were effective, as the survivors explained in strained and broken voices in the hospital next day. In some cases the respirators had been carried in the men's caps or pockets for weeks, and were dry when put to the test. It is noteworthy that some battalion commanders, warned by the gas surprise a month earlier, had initiated respirator drill, and had given their men the most stringent instructions about keeping the respirator pads moistened, and had shown them exactly how the respirators were to be worn. These battalions are stated to have escaped practically unscathed.

It might be well to refer briefly to the most characteristic symptoms and how they are produced. Asphyxia is the most prominent symptom. The cyanosis is mainly due to want of oxygen, the result of choking of the lungs and bronchial tubes with fluid. This outpouring of fluid is so great that the bronchi seem quite full, and the patient is in danger of being drowned in his own secretions. Even when the blueness begins to disappear and the patient's colour improves, the respiration continues to be hurried and panting, and it is believed by some authorities that an acid condition of the blood is produced. In the rare cases where acute chlorine poisoning has occurred in chemical works or elsewhere, the symptoms are similar to those produced by the German gases. The severity of the cases

depends on three factors :—(a) The concentration of the gas (whether encountered undiluted or diluted with air); (b) the duration of exposure; and (c) the efficiency of the respirators and the care with which they have been applied. For general purposes the cases may be divided into three groups :—(1) Mild cases; (2) moderately severe cases; and (3) very severe cases; and these represent (1) a primary asphyxia, due to lack of oxygen and partly to spasm of the glottis; (2) asphyxia, due to the outpouring of fluid into the bronchial tubes; and (3) bronchitis and broncho-pneumonia.

The majority of cases that have reached this country have exhibited symptoms of a mild bronchitis, but a certain proportion have been cases of severe bronchitis, with broncho-pneumonia, and several have proved fatal.

Mr. Henry Brunner, the well-known chemist, suggests the inhalation of alcohol, by means of a cloth moistened with whisky, brandy, rum, or rectified spirit, as a palliative. It is known that alcohol absorbs chlorine with avidity, and the compounds formed by the interaction of the two substances are practically harmless. Mr. Brunner's son, also a chemist, who was once accidentally gassed by chlorine, found the inhalation of Eau de Cologne extremely soothing. In mild cases a slight bronchial sedative and plenty of fresh air are all that are required. In the rather more severe type of case belladonna or atropine has been recommended, with the view of diminishing the profuse bronchial secretion, while emetics have also been found useful.

Preventive treatment, however, is by far the most important aspect of the question, and applies with particular force to poisonous gases. Gassing may be prevented in one of two ways :—(1) By preventing the access of the gases, *e.g.*, by precluding their entrance into trenches or dwelling-houses; (2) by neutralising the poisonous effects of the gases before they are breathed into the lungs.

The Chief Commissioner of Police has issued a warning that anything which irritates the eyes should be regarded as an indication of the presence of poisonous gas, and, if caught in

the street, the obvious thing to do is to run in the direction from which the wind is coming. It has been found that most of the asphyxiating gases are acid in character, and that, therefore, they can generally be neutralised by the use of an alkali. Common washing soda is the particular alkali that is found in every house, and a 10 per cent. solution of washing soda, *i.e.*, 1lb. to a gallon of water, is about the right proportion. It is well, however, to have a simple and handy form of respirator ready for use, and the Commissioner of Police advises that it should be large enough to protect the nose as well as the mouth, with gauze so adjusted as to protect the eyes. The German soldiers have been equipped with respirators containing hyposulphite, which neutralises either chlorine or bromine, and solutions can be readily obtained containing both carbonate and hyposulphite of soda in certain proportions. A portable respirator can be made by saturating it with a strong solution and allowing the respirator to dry. The dried respirator can then be carried in the pocket and damped with ordinary water before use. If kept in a sponge bag it will keep moist for many days. Various patterns of respirators can be obtained. The War Office design consists of cotton waste soaked in lotion and covered with black gauze netting, which reaches over the whole face so as to cover the eyes. The respirator especially approved by the Institute of Hygiene consists of a combination of cotton wool, flannel, and towelling, with a separate face-piece of black netting, which covers the whole of the face, including the respirator. It is simple and effective, but, as many have been examined, and they vary much in utility, it would be well to get advice before relying on some of those now offered.

The lecturer concluded by pointing out that most of the Zeppelin raids have taken place between eleven o'clock at night and two o'clock in the morning, and have always been timed about the new moon, that is, they take place when there is little or no moon in the sky.

LENNOX WAINWRIGHT (*Lancet*, July 24th) describes a case of recent gas poisoning as follows :—

“A private in the Royal Irish Regiment was gassed on May 24th. The gas was sixty yards away when first seen, and arrived at the trench in about thirty seconds. The respirator used was the original one sent out, viz., a pad and thin bandage. The symptoms described by the patient were as follows: Smothering feeling, coughing, eyes smarted, felt drunk, could not breathe, inward pain in the stomach, could use arms and legs, knew all going on, but became unconscious two hours afterwards. Fifteen cylinders of oxygen were used, and the patient was in bed three weeks; he was then transferred to Folkestone. The chest was full of coarse râles and the throat was always complained of as feeling raw and sore. Blood count: Hæmoglobin, over 100 per cent.; red cells, 5,700,000; white cells, 3,000; polymorphs, 62 per cent.; large lymphocytes, 5 per cent.; small lymphocytes, 34 per cent.; eosinophiles, nil. This does not show hæmolysis. Urine: No hæmatoporphyrinuria. The blood in this case does not answer to Professor Hake's chlorine experiments, but this may be due to treatment.

I am inclined to think the gas is nitric peroxide made from nitrate of ammonia, and the symptoms are more like nitric peroxide than chlorine. Until the experts can safely say what the gas really is, hyposulphite of soda is a dangerous ingredient, as it liberates free sulphur in the presence of N_2O_4 . Therefore ordinary washing soda is a safer antidote in respirators.”

In reference to the writer's remarks the following editorial note is appended:—

“The discrepancies in clinical and post-mortem observations in connection with gassed patients may be due to the use by the Germans of different gases on different occasions. Reports from the trenches confirm this possibility. At one time the gas was described as brown, and at another as green. The former colour complies with the description of nitric peroxide, the latter with that of chlorine. Dr. Lennox Wainwright's blood count was taken three weeks after the attack, and when 15 cylinders of oxygen had been administered, and he admits rightly that the results, which showed no disturbance in the blood, may have been due to treatment. Is

hyposulphite a dangerous ingredient of a respirator because nitric peroxide liberates from it free sulphur? We are not convinced, but at any rate a strong solution of the crystals of ordinary washing soda (say, 20 per cent.) is the safest fluid to use in this way. It negatives all acid gases in which are included both chlorine and nitric peroxide."

Therapeutic measures calculated to relieve the symptoms arising from "gassing" have been numerous and varied. It is stated by Roberts that in cases of asphyxiation, where oxygen is the antidote, the Germans employ an apparatus called the "Pulmotor." It operates by forcing oxygen into the lungs and drawing out the air, and is described by the author in his book.

Symes (*British Medical Journal*, July 3) has tested the efficacy of several drugs which have been suggested for the alleviation of the bronchial and bronchiolar obstruction by experiments on cats.

"The 'gas' (bromine vapour) was administered through a tracheal canula. Its usual effect was rapid obstruction of the airway. Less commonly the obstruction came on gradually, several minutes elapsing before the tracing was reduced to one-half of its initial amplitude. In some cases profuse bronchorrhœa appeared in the course of an hour.

"In all cases the relief afforded by intravenous injection of the broncho-dilator drugs has been little or nothing, whilst the same (or similar) drugs administered by inhalation have consistently given relief, which, though not always great, has at times been considerable.

"The drugs so far tested are the following :—

"*Amyl nitrite*.—Injected intravenously, in suspension in normal saline, or subcutaneously without dilution, this body has given no relief. Inhaled, it has at times produced slight and temporary dilatation of the airway, but has more than once appeared to increase bronchorrhœa.

"*Atropine*.—Atropine sulphate, in intravenous doses ranging from 0.5 mg. to 10.0 mg., has been without effect on the airway.

“ *Adrenalin*.—Intravenous administration of 0.1 mg. of adrenalin chloride has, on one occasion, afforded slight and temporary relief, but in the majority of cases has been without benefit.

“ *Stramonium*.—Intravenous injection of an infusion of stramonium leaf was without effect. Inhalation of the fumes from the smouldering powdered leaf, on the other hand, has consistently relieved the obstruction. The degree of relief depends, obviously, on the amount of fume inhaled. With respiration diminished by pronounced obstruction the relief is consequently small; but when the force of (artificial) respiration is augmented and pulmonary ventilation thereby increased, stramonium fumes produce considerable and lasting dilatation of the airway.

“ *Lobelia, Tobacco, Opium*.—Pulv. lobeliae co. (Martindale), a powder containing a little lobelia in addition to stramonium, has also worked well, though up to the present it has not seemed more efficacious than the stramonium alone.

“ Fumes from smouldering tobacco (or snuff) have also dilated the airway.

“ Opium fumes have been found to give relief. The dilatation has not been great, but has once proved relatively lasting.

“ *Chloroform*.—Chloroform vapour has on one occasion distinctly increased the obstruction. On no occasion has it appeared to give relief.

DISCUSSION OF RESULTS.

“ The failure of atropine injections to relieve the respiratory obstruction was surprisingly complete. In view of this failure and of the equal non-success of stramonium infusion and of adrenalin, contrasted with the efficacy of stramonium and other fumes, it appears that the bronchial circulation was largely, if not completely, arrested by the bromine vapour, and that relief was only afforded by direct contact of the remedies with the bronchial (and bronchiolar) mucosa. The efficacy of the stramonium fumes indicates further that muscular spasm is a factor in the obstruction.

“Of the drugs that have been tried, stramonium has so far been the most successful. Mixed with a little nitre, it is readily ignited, and smoulders freely. The fumes should, for obvious reasons, be inhaled through the nose rather than through the mouth. Overdosage from absorption of the active principles—atropine, hyoscyamine, hyoscyne—through the pulmonary alveoli will be shown so clearly by thirst, by dilatation of the pupil, and by acceleration of the pulse, that dangerous dosage should be readily avoidable. Moreover, it may be anticipated that early and repeated administration will diminish the distressing bronchorrhœa of the later stages of gas poisoning.

“Lobelia, tobacco, and perhaps opium, may fairly be tried, either alone or with stramonium. The objections to the use of opium fumes are obvious and serious. But in the absence of relief from other sources, and given adequate ventilation of the ward, these objections do not suffice to debar a careful trial.

“For the reasons given above both chloroform and amyl nitrate appear to be objectionable, and their use, if adopted, should be carefully watched.

CONCLUSIONS.

“The respiratory obstruction set up by inhalation of irritant gas is relieved by inhalation of stramonium and other fumes.

“Treatment through the blood stream, either *via* the mouth or by injection, appears to be inefficacious.”

Should it be found that carbon monoxide has been employed the method of treatment suggested by Pic and Durand (*Lyon Medical*) may be tried. It consists in the subcutaneous injection of large quantities of oxygen (230 litres were injected in 22 hours in the case described). It is necessary to be absolutely sure of the purity of the gas employed since the least trace of nitrogen would lead to the formation of emboli.

NOTES AND NEWS.

ARMY MEDICAL PAY AND ALLOWANCES.

THE anomalous position of officers of the Medical Service of the Territorial Force now mobilised and serving, in respect of the pay and allowance they receive, has been repeatedly brought to the notice of the War Office, but up to the present has received no redress.

The following shows the rate of pay at the present time of a Captain R.A.M.C. (T.F.) :—

	£	s.	d.	
Regimental pay	0	15	6	per day.
Rations, or in lieu thereof a				
sum of	0	2	0	„
Field allowance, if not provided				
with lodging and attendance	0	3	6	„
Total	£1	1	0	„

The pay and allowances of a lieutenant R.A.M.C., whether Regular or Territorial, appear to be as follows :—

	£	s.	d.	
Regimental pay	0	14	0	per day.
Ration money	0	1	9	„
Servant's allowances	0	1	0	„
Field allowances	0	2	6	„
Total	£0	19	3	„

The rate of pay of civilian medical officers who, in response to the notification of the War Office made immediately after the outbreak of war, agreed to serve at home or abroad as surgeons with the Army, and have been granted temporary rank of

lieutenant in the Army, is 24s. a day, inclusive of all money allowances, except travelling allowances and expenses when travelling on duty. They will receive a gratuity of £60 at the termination of their engagement if they have rendered satisfactory service. There is also an allowance of £30 for uniform. A temporary lieutenant R.A.M.C., therefore, although he may be quite recently qualified and may be making no pecuniary sacrifice in joining the Army, appears to receive at least 3s. a day more than a captain R.A.M.C. (T.F.), and 4s. 9d. more than a lieutenant R.A.M.C. (T.F.) receives in pay and allowances. A more correct comparison would seem to be between the inclusive pay of the temporary lieutenant and the pay of the captain or lieutenant R.A.M.C. (T.F.), who receives rations; the respective payments are then seen to be 24s., 19s., and 17s. 6d. respectively.

The explanation given by the Financial Secretary to the War Office, in reply to a question in the House of Commons on August 27th, was, that all officers commissioned in peace draw under the terms of their contract the pay and allowance of the Regular Army, varying according to the ranks which they hold. It was necessary, he said, to give higher rates to those commissioned on emergency, but there was no intention of making this universal. Territorial officers were serving under a running contract under which they had engaged.

The officers R.A.M.C (T.F.) are serving (1) with field ambulances; (2) with units other than medical units, that is to say, for the most part with battalions; (3) clearing hospitals; (4) in general hospitals; (5) in the sanitary service. The number in the last category is small, and the officers serving with general hospitals do not, as a rule at least, give the whole of their time.

The hardship, therefore, seems to be in the case of the first three categories. These officers are, or may be, taken away from the localities in which they practice, and in all such cases must be reckoned to give the whole of their time to their military duties.

A great deal would seem to turn upon the question whether a Territorial medical officer has to give the whole of his time to his military duties. This is certainly the case in many instances, and the fact that this is so at present is so far recognised by the War Office that at the instance of the General Medical Council it issued on December 10th the following circular letter intended to facilitate exchanges :—

To the General Officer Commanding-in-Chief
Command, All Commands at Home.

War Office, London, S.W.,

10th December, 1914.

Royal Army Medical Corps.

Sir,—I am commanded by the Army Medical Council to acquaint you that in order to mitigate as far as possible the inconvenience to the civil population and to Territorial Force Medical Officers, owing to enforced changes of station, the following measures will be adopted, the object in view being that these officers may be able, as many medical officers attached to general hospitals are at present able, to give part of their time to civil practice in their own districts :—

1. When a mobilised Territorial unit is moved from its own locality in Great Britain the medical officers may be allowed :—

(a) To effect changes, direct or indirect, with Territorial medical officers in the new locality when possible.

(b) If the above is not feasible, the places of medical officers not desiring to accompany their units may be taken by junior medical officers willing to take temporary commissions and serve with such units, the original medical officers being demobilised until the return of the units to their own localities, or until their services can be otherwise utilised there.

2. When a mobilised Territorial unit volunteers for imperial service abroad the medical officer will be given the option of accompanying it or of serving with the reserve unit raised for home defence in its stead, vacancies in both units being filled up by junior medical officers with temporary commissions.

To facilitate such exchanges a list is kept at the War Office of junior practitioners willing to accept general service either at home, in the field, or abroad, from which substitutes can be detailed as occasion arises.

The medical officers themselves might be of assistance in procuring substitutes to take their places, possibly from their own neighbourhoods, whose names would be placed on the list.

I am, Sir, your obedient Servant,

B. B. CUBITT.

It does not appear that this concession has been of much practical value. So far as our information goes, its effect has been largely discounted by the fact that Territorial medical officers stationed in inconvenient localities have been required to find their own substitutes before any exchange can be sanctioned.

The number of Territorial officers in all ranks in the December *Army List* was 2,144; of these, 745 were serving in the general hospitals and 119 in the sanitary service, making a total of 864, and leaving 1,280 medical officers of field ambulances (609), clearing hospitals (31), and battalions (640), who must be all more or less completely prevented from carrying on their ordinary practices, and whose earned incomes are therefore limited to what they receive as military medical officers. The same of course applies to those serving overseas.

Many of the temporary lieutenants have been gazetted to Service Battalions (Kitchener's Army), and this brings into prominence the anomaly that a lieutenant who may have been recently gazetted to a Territorial (Reserve) battalion receives less (about £80 a year) than a temporary lieutenant gazetted to a Service battalion of the same regiment.

It may be convenient that we should reproduce here from the Royal Pay Warrant, 1914, the relevant parts of Section X., dealing with wounds, pensions, and gratuities.

Section X.—Wounds, Pensions, and Gratuities.

1. *Wounds and Injuries received in action.*

639. *Loss of limb or eye.*—A gratuity according to the following scale shall, in the first instance, be granted to an officer who has received a wound in action which has occasioned the loss of an eye, or a limb, or of the use of a limb :—

Colonel	...	...	...	...	£600
Lieutenant-Colonel	...	...	...	...	450
Major	...	...	...	...	300
Captain	...	...	...	...	250
Lieutenant	...	...	...	...	140
Second-Lieutenant	...	...	...	...	100

640. *Pension.*—From the expiration of one year from the date of the wound or injury the wounded officer referred to in Article 639 may, subject to the conditions laid down in Articles 641, 642, 652, and 653, be granted a permanent pension, according to the following scale :—

Rank of Officer at the date of wound or injury.					Yearly.
Colonel	...	...	...	...	£300
Lieutenant-Colonel	...	...	...	...	300
Major	...	...	...	...	200
Captain	...	...	...	...	100
Lieutenant	...	...	...	...	70
Second-Lieutenant	...	...	...	...	70

641. *Loss of sight must occur within five years.*—A pension shall not be granted for the loss of an eye consequent upon a wound received in action, unless loss of vision occurs within five years after the wound, and is solely attributable to such wound.

642. *Claim for each limb or eye lost.*—An officer may be recommended for a gratuity and a pension for each limb or eye, the loss of the use of which has been caused by a wound received in action.

643. *Injury equivalent to loss of limb, etc. : Gratuity.*—An officer who has received in action bodily injury certified by the regulated medical authority to be equivalent to the loss of a limb, shall, in the first instance, receive a gratuity as laid down in Article 639.

645. *Very severe wound : Gratuity.*—An officer who has received in action a bodily injury, certified by the regulated medical authority to be very severe, though not equivalent to the loss of a limb, may, at the discretion of our Army Council, be allowed a gratuity according to the scale laid down for his rank in Article 639, if he has been disabled for a year from performing military duty. If the disablement has lasted less than a year a proportionate gratuity may be granted, the minimum being one-quarter of the amount laid down in Article 639.

2. *Wounds and Injuries received Otherwise than in Action.*

648. *Loss of limb or eye or very serious injury : Pension.*—If an officer of our Regular Forces, Special Reserve of Officers, Reserve of Officers, Militia, Territorial Force or Volunteers loses, through the performance of military duty, otherwise than in action, a limb or an eye, or sustains any other injury or injuries reported by the regulated medical authority to be of a permanent and very serious nature, he may be recommended for a pension not exceeding that shown in the following table.

The rate of pension and the period of its continuance shall be determined by the merits of each case, special regard being had to the fact of the injured officer being or continuing to be disabled, or otherwise, from the performance of his duties, and to the degree of contributory negligenc (if any) attributable to him. The pension shall, in all other respects, be subject to the conditions applicable to officers injured in action.

Rank of Officer at the date of wound or injury.					Maximum Pension.
Colonel or Lieutenant-Colonel	...	...	...	...	... £250 a year.
Major	...	...	...	...	... 150 ,,
Captain	...	...	...	...	... 75 ,,
Lieutenant or Second-Lieutenant	...	...	...	...	... 50 ,,

651. *Temporary or Local Commissions.*—Officers holding temporary or local commissions in our Army, and paid out of Army funds, shall be entitled to gratuities and pensions for wounds or injuries under the conditions laid down in this section of this our warrant.

652. *Wounds pensions tenable with pay, etc.*—A pension for a wound or injury may be held together with any other pay and allowances to which an officer may be entitled, and may be granted to, and may continue to be held by, an officer after leaving our service.

653. *Period of claiming.*—No claim to a wounds or injury gratuity or pension shall be entertained unless the officer applies for the same within five years after being wounded.

Pensions to the Families of Officers.

The pensions and gratuities allowable to the families of officers of the Regular Army, the Special Reserve of Officers, and the Territorial Force, and to the families of officers holding temporary commissions for the purposes of the present war, are as follows :

Widows and Children.

CLASS A.			CLASS B.			
Families of officers killed in action or dying of wounds received in action within seven years after having been wounded.			Families of officers dying from disease caused by fatigue, privation or exposure incident to active operations in the field, or from wounds or injuries sustained on duty (not in action) within seven years after removal from duty for the disease or injury.			
Rank of officer— that is, permanent rank, unless the officer holds only temporary rank	Pension to Widow (during widowhood) Yearly	Compassionate allowance for each child (sons till 18, daughters, un- married, till 21) Yearly	Gratuity in addition to pension, etc.		Pension to Widow (during widowhood) (No gratuity is payable in these cases) Yearly	Compassionate allowance for each child (sons till 18, daughters, un- married, till 21) Yearly
			Widow	Each Child		
	£	£	£	£ s. d.	£	£ s. d.
Lieut.-Col. ...	180	24	450	150 0 0	135	20 0 0
Major ...	140	21	300	100 0 0	105	17 10 0
Captain ...	100	18	250	83 6 8	75	15 0 0
Lieut. ...	80	15	140	46 13 4	60	12 10 0
2nd Lieut. ...	80	15	100	33 6 8	60	12 10 0

Motherless children.—Twice the above rates of compassion allowance may be granted to motherless children. If an officer (Class A) leaves a *daughter only* (unmarried and under 21) she may be granted, in lieu of the above rates, a special allowance varying from £40 to £90 a year, according to rank. These awards are in addition to the gratuity.

Mothers.—If an officer (Class A) leaves neither a widow nor legitimate child, his mother, if a widow without other pension or adequate provision, may be granted a special pension varying from £40 to £90 a year, according to rank, provided that she had been mainly dependent on the officer.

Sisters.—If an officer (Class A) leaves neither widow, legitimate child, parent, nor brother, a similar pension may be granted to his sister or sisters, jointly, if unmarried, subject to the above proviso.

Applications.—All applications for the grant of pensions, as above, should be addressed to the Secretary, War Office, Whitehall, S.W.

BIRMINGHAM WAR SERVICE COMMITTEE.

THE Hon. Sec. of the Birmingham Medical Assistance Committee asks us to state that that Committee is now amalgamated with the Birmingham War Service Committee of the B.M.A.

All communications regarding the work of the Medical Assistance Committee should in future be addressed to Dr. Bekenn, Monument Road, the Hon. Sec. of the War Service Committee.

BOOK REVIEWS.

Studies in Questions Relating to Eye Training. By WILLIAM PHILLIPS, M.A. London : Blackie and Son, Ltd. Price 1s. 6d. net.

IN the "foreword" the author states that "the object aimed at in the following pages is to discover, if possible, whether the efficiency of the eye as an optical instrument can be increased by training or special exercises."

He is careful to discriminate between training of vision and the training of the mental faculty of observation. The latter is outside the scope of his inquiry. The possibility of improving visual acuity by certain exercises has agitated the minds of many people, particularly of ophthalmologists, and it must be admitted that no definite evidence has hitherto been brought forward to show whether any effect of this sort can be brought about or not. The author in his search for evidence on this obscure subject covers a wide field of observations on the visual and other senses in human beings, male and female, civilised and savage, and in animals.

Much attention is given to the question as to whether eye-training is likely to counteract the growth of myopia, but no reference is made to the more solvable question of the possibility of training an amblyopic squinting eye.

From a pedagogic point of view the question of counteracting the growth of myopia is a very important one, but it does not help us much in the solution of the author's quest. His investigations, however, are valuable, and his conclusions are interesting and instructive to medical men.

The work is an able dissertation on a subject of intense interest and of considerable importance to the race, and the

author's numerous suggestions should lead to further investigations on the same broad lines by others who should deal with the subject more from the purely medical point of view.

We commend the work to the notice of school authorities, ophthalmologists and all concerned in the welfare of children.

Medical Applied Anatomy. By T. B. JOHNSTON, M.B., Ch.B.
London : A. & C. Black, Limited. Price 7s. 6d. net.

THE physician, no less than the surgeon, is daily called upon to apply his knowledge of anatomy in the exercise of his profession, and yet the demand for a treatise on the subject of applied medical anatomy has not hitherto received much attention from those qualified to deal with the subject. The author of this volume has boldly taken up the task and has been successful in producing a highly readable and clear, if succinct, treatise on medical anatomy. It is evident that it is a matter of some difficulty to deal with such a wide subject in the compass of about 400 pages, and we notice in this book a tendency to over-compression in some places. The text is, however, greatly elucidated by the numerous illustrations throughout the work. Considering the high state of perfection that has been attained in anatomical illustrations those given in this volume are not of high artistic merit, but they serve the purpose for which they are intended quite well, but in a future edition it might be possible to combine usefulness with artistic treatment.

The book contains much information that is not found in books on practical anatomy, *e.g.*, a section is devoted to the question of referred pain, the anatomical basis of heart block is discussed, and outlines of the development of certain parts of the body are included.

The subject matter has been dealt with according to systems and not according to regions, and this method will appeal to the student of clinical medicine as being more rational than that generally adopted in books on applied anatomy. Full

advantage has been taken of the valuable aid afforded by the use of radiography in the elucidation of disease, and several illustrative radiographs are included.

The author has in the main adopted the use of the Bâle terminology in accordance with the prevalent custom among anatomists, but he supplies a glossary which will be found useful by teachers, senior practitioners and students who have not familiarised themselves with the more modern nomenclature. The work bears the impress of a careful study of the anatomical requirements of the medical practitioner by a teacher of extensive experience, who presents the essential facts of his subject in a concise and lucid manner. We can confidently recommend the work as a sound guide on medical applied anatomy.

PUBLISHERS' ANNOUNCEMENTS.

MESSRS. HENRY FROWDE, HODDER & STOUGHTON announce that they have made arrangements for the immediate publication of their "Oxford War Primers of Medicine and Surgery." They state that "the primers are written mainly by members of the profession holding commissions in the Naval and Military Services, who have had special experience of the subjects they have undertaken, or by those who have peculiar knowledge of the requirements of patients recovering from wounds or special diseases incidental to war conditions. They are intended for the use of practitioners who are taking temporary commissions in the Navy and in the Royal Army Medical Corps, as well as those working in connection with the Red Cross and the St. John Ambulance Society in this country. The object of the present series is to provide a description and treatment of the various injuries occurring in war. These injuries differ so greatly from those met with in usual practice that it is thought an account of the diagnosis, prognosis, and treatment, written shortly and not encumbered by too much detail, will prove serviceable to the large number of medical

men who have so patriotically devoted their time to the wounded. The volumes will be written from a practical standpoint. The size will be suitable for the pocket, and they will be strongly bound in waterproof cloth. The series will be issued under the general editorship of Lieut-Colonel D'Arcy Power, R.A.M.C. (T.), M.B. (Oxon.), F.R.C.S. (Eng.)."

The following volumes are promised immediately :—

Wounds in War : Their Treatment and Results. By
LIEUT.-COLONEL D'ARCY POWER.

Wounds and Injuries of the Head. By MAJOR L. BATHE
RAWLING.

Wounds and Injuries of Joints. By MAJOR ROBERT JONES.

Injuries of Bones. By CAPTAIN E. W. HEY GROVES.

Injuries of Nerves. By COL. PURVES STEWART and CAPT.
ARTHUR H. EVANS.

Injuries of the Thorax. By STAFF SURGEON J. KEOGH
MURPHY.

Injuries of the Abdomen. By PROF. RUTHERFORD MORISON,
Hon. Staff Surgeon R.N.V.R.

Injuries of the Eyes, Throat, Nose and Ears. By MAJOR
H. MAITLAND RAMSAY, MAJOR DUNDAS GRANT, and
CAPT. C. ERNEST WEST.

Nerve Injuries and Shock. By CAPT. WILFRID HARRIS.

Medical Aspects of War. By COL. J. EDWARD SQUIRE.

Cerebro-Spinal Fever. By CAPT. THOMAS J. HORDER.

Handbook of Massage. By LOUISA L. DESPARD.

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THE TREATMENT OF ACUTE EMPHYSEMATOUS GANGRENE.

By BREVET-COLONEL C. B. LAWSON and BECKWITH WHITEHOUSE, M.S. (Lond.), F.R.C.S., *Late Hunterian Professor Royal College of Surgeons.*

IN the present European conflict one of the outstanding features of medical importance is the incidence amongst the wounded of cases of tetanus and acute emphysematous gangrene. As to the actual extent to which these two conditions are still prevailing it is impossible to say. It is evident, however, that sufficient material is forthcoming upon which to base a more extended knowledge than is at present extant. The very high mortality previously associated with both these diseases is generally recognised in all text books on surgery. Thus in Rose and Carless' "Manual of Surgery," 1911, under the heading of "Acute Spreading, Acute Emphysematous or Spreading Traumatic Gangrene," appears the following:—"This is one of the most rapidly fatal and serious conditions met with in surgery."

The object of the present communication is to draw attention to a new method of treatment of emphysematous gangrene, which in our hands has been attended with well-marked success. Amongst the cases of shell and gunshot wounds admitted to No. 8 Military General Hospital at Rouen, France, during the months of September and October, 1914, there occurred seventeen

examples of gangrene affecting the extremities. Three of these were of the purely traumatic variety, and directly due to interference with the vascular supply. The remaining fourteen, on the other hand, were all types of the condition variously termed infective gangrene, emphysematous gangrene, or hospital gangrene; eight of these involved the upper extremity, and six the lower. All were the direct result of severe shell wounds infected on the field by earth or refuse. The first three cases admitted to the hospital were treated upon existing lines, and all rapidly proved fatal. The first patient was extremely weak and toxæmic upon arrival, and did not recover from the shock attendant upon amputation through the upper third of the thigh. In the remaining two patients the gangrenous area had already extended to the abdominal wall and amputation was out of the question. Both cases were treated by application of hydrogen peroxide to the wounds, but both rapidly succumbed.

The fourth patient also appeared *in extremis* when he reached the hospital. He had been wounded on September 14, during an engagement on the Marne, and reached Rouen three days later. Upon arrival he presented a very large lacerated wound upon the posterior aspect of the right knee, extending upwards into the muscles of the thigh. The wound was extremely foul and the tissues around were œdematous, devitalised, and emphysematous. Typical blebs were present on the skin surrounding the wound, and from the contained fluid a long un-encapsulated anaerobic bacillus was cultivated. Amputation was performed through the upper third of the thigh, but at the operation it was evident that the infection had spread to a high level, and that it was impossible to remove the limb above the area involved. The patient was much collapsed, and the operation was concluded as rapidly as possible. Within twenty-four hours it was evident that the infection was spreading rapidly in the flaps covering the stump. It then appeared to one of us (B.W.) that it might be possible to limit the spread of the disease by infiltrating the tissues above the gangrenous area with oxygen. The handiest method available was the injection of hydrogen peroxide into the tissues under pressure. Small inci-

sions were made therefore *into the healthy tissues above* the infected area, and through these punctures hydrogen peroxide was pumped into the subcutaneous and subfascial planes by means of a Higginson's syringe. The evolution of oxygen was rapid, and the stump soon assumed enormous proportions, emitting a resonant note on percussion. From this moment the spread of gangrene was arrested. The existing gangrenous portion sloughed away, the surrounding skin area assumed its normal tint, and the circulation was re-established. The man made an uninterrupted recovery, and when convalescent was transferred to England.

The success which attended this case decided us to employ the same method on a subsequent occasion. On September 30 the next opportunity occurred. A patient was admitted with a large lacerated shell wound on the outer surface of the left thigh in its upper third. A very offensive discharge was present and the skin around was discoloured and sodden. Œdema, with definite crackling on palpation, extended up to the crest of the ilium. The patient was jaundiced and his general condition very weak. Amputation of the limb could not be entertained, and hydrogen peroxide (10 vols.) was injected subcutaneously above the line of the advancing œdema. Small punctures were also made through the tissues just above the wound, and hydrogen peroxide was injected under pressure. Twenty-four hours later it was evident that the infection was arrested. The jaundice disappeared, and subsequently the whole gangrenous area came away in a huge slough involving skin, subcutaneous tissues, and fascia, leaving a very large granulating area. This had considerably diminished in size when the patient was transferred to England, his general condition being excellent in every way. Thiersch grafting was necessary to restore the limb to its functional ability.

The rapid arrest of the infection in these two cases proved to us that in the method we had not only a valuable means of saving life, but also of obviating the necessity for amputation, and so preserving the function of many limbs that otherwise would be sacrificed. The procedure now adopted by us in all

cases where infection of a wound by anaerobic organisms is suspected may briefly be summarised as follows :

Operation.—Half an hour before operation the patient receives a hypodermic injection of atropine sulphate $\frac{1}{100}$ gr. and morphine tartrate $\frac{1}{4}$ gr. General anæsthesia as a rule is employed, but if the patient is profoundly septic, and the wound involves the lower extremity, spinal analgesia is recommended. A point is then selected three to four fingers' breadth above the line of advancing gangrene, as shown by the dusky, copper-coloured tint of the integument. An incision about $\frac{1}{4}$ in. in length is made through the skin and subcutaneous tissues as far as the fascial sheaths of the muscles. A pair of sinus forceps is then introduced into the wound and the whole of the subcutaneous tissue opened up as widely as possible. The nozzle of an ordinary Higginson's syringe is introduced into the incision and neutral hydrogen peroxide (10 vols.) at body temperature pumped into the subcutaneous spaces under pressure. The dissemination of oxygen is aided by kneading and massage. It is essential that the belt of oxygen be complete above the line of advancing gangrene, and therefore it is usually necessary to repeat the procedure at various points. This done, the gangrenous area itself is treated in a similar manner by puncture and infiltration. Finally the wound is thoroughly explored and cleansed. All foreign material and dead and contused tissue is removed and the cavity irrigated, first with normal saline to wash away debris and clot, and then freely with hydrogen peroxide. Drainage by rubber tube and gauze is established and the whole limb dressed with dry gauze and wool. Although much drainage may be anticipated, we consider it a mistake to employ huge quantities of wool and gauze in these cases. The aim should be to allow free access of air to the wounded tissues, coupled with efficient protection to the same.

The operation is followed by considerable shock, due undoubtedly to the wide separation of connective tissues and stimulation of nerve endings. The usual measures are instituted to combat the shock, and morphia is freely administered to relieve the pain, which is generally very acute. At the close

of the operation the limb, in the case of the upper extremity, is ballooned to twice its normal size, and the emphysema frequently extends to the trunk and neck. In our series of cases shock was much more marked when the upper extremity was involved than in the case of the lower. A point of pathological interest is the bright yellow colour of the fluid which exudes from the tissues of the diseased limb on section. This is even more evident in the presence of hydrogen peroxide. What the exact nature of the pigment may be it is impossible with our limited facilities at the front to ascertain.

Risks of the Operation.—We consider that the dangers of the operation are mainly twofold: (1) Shock, and (2) air embolism. As previously stated, there is undoubtedly an element of shock associated with the procedure, due to the stimulation of nerve endings and varying in degree with the extent of the area infiltrated. It is most marked in our experience in cases where the upper extremity is involved, and especially when it is necessary to infiltrate the subcutaneous tissues of the thorax. At the same time the collapse is no more severe than that associated with amputation carried out under similar conditions, and it can certainly be combated by care and the adoption of ordinary measures. The operation should not be performed without general anæsthesia, and an allusion has already been made to the value of the spinal method of analgesia in cases involving the lower extremity.

As regards the risk of air embolism, we have not had a fatality of this nature directly attributed to the operation. At the same time we recognise its possibility, and advocate particular care in avoiding trauma to veins both at the sites of puncture and also during the separation of the subcutaneous tissues. Concerning a third possible objection, that the operation may not be efficient to check the progress of the infection, in our experience this risk does not exist. Certainly in every case in which it has been employed arrest of the gangrene has been assured. Further experience with a longer series of cases may cause us to modify this statement, although a consideration of the facts, both clinical and post-mortem, go to prove that

acute infective gangrene of the type now occurring in France is essentially a local process spreading by direct continuity in the subcutaneous tissues, and that it can be effectively checked by the establishment of "outposts" instituted in the manner described.

In our cases the organism present has almost invariably been the *bacillus aerogenes capsulatus*. In two cases only did it prove to be the bacillus of malignant œdema.

The results so far obtained may be stated as follows :—

Total number of cases	...	...	...	14
Upper extremity	...	...	...	8
Lower extremity	...	...	...	6
Cases treated by infiltration	...	...	...	11
Cured	...	...	...	8
Cases not treated by infiltration	...	...	...	3
Cured	...	...	...	0

Of the three deaths occurring in cases treated by the infiltration method, one was due to osteomyelitis of the femur and septicæmia; another to shock; whilst the third was a fatality under anæsthesia in a subject of lymphatism, and not attributable to the condition present or to the operation. In the case of osteomyelitis of the femur an extensive compound comminuted fracture was present. The anaerobic infection was completely arrested when septicæmic symptoms developed, and this was confirmed by autopsy.

The conclusions at which we have arrived, and on which we are at present basing our practice, may be stated as follows :—

Conclusions.—(1) Acute infective gangrene due to *B. aerogenes capsulatus* or *B. œdematis maligni*, in the case of the extremities, is at first a purely local process spreading by direct continuity in the subcutaneous tissues. The muscles and deeper tissues are only involved in the immediate neighbourhood of the wound. When gangrene of the whole limb exists it is due to severe trauma, especially to the main vessels. Acute infective gangrene and traumatic gangrene may be superimposed.

(2) Amputation of a limb for acute emphysematous gangrene is unnecessary unless the whole of the tissues are involved over a very extensive area. It is sufficient to remove only dead and dying tissues, and *amputation high above the infected area is contra-indicated, and may prove fatal from shock.*

(3) Infiltration of the healthy subcutaneous tissues with oxygen above the line of spreading gangrene is sufficient to check the advance of the infection, and in the majority of cases the limb may be saved.

(4) The most convenient means of applying nascent oxygen to the tissues is by the injection of warm neutral hydrogen peroxide.

(5) The operation is not unattended by risk, and care must be taken to obviate shock and trauma to veins.

Note.—Since this paper was written other cases of acute emphysematous gangrene have been admitted to No. 8 General Hospital, involving both the upper and lower extremities. These patients were all treated by infiltration of the tissues with oxygen, and the results were eminently satisfactory.

One case was further complicated by severe tetanus, and was successfully treated by daily lumbar injections of anti-tetanic serum (1,500 units) and the adoption of the Trendelenburg position.

The direct subcutaneous administration of oxygen or air apart from hydrogen peroxide has been under consideration as a means of checking the spread of anaerobic infection, and appears to possess certain advantages over the original method. The chief advantage in employing oxygen rather than hydrogen peroxide lies in the fact that the tissues are not left in a water-logged condition. Devitalisation apart from the original lesion is nil and therefore subsequent sloughing is reduced to a minimum. Furthermore the operation can be conducted without anaesthesia and appears to be painless. In fact in many cases patients appeared to like the actual infiltration and expressed themselves as feeling distinctly better.

Oxygen is conducted directly into the affected tissues through a needle connected by rubber tubing to a cylinder of the

gas. It is washed by passing through a glass tube containing sterile cotton wool, and heated by means of a spirit lamp placed beneath this tube. Infiltration is conducted slowly and continued until the affected tissues and the parts well above the lesion emit a resonant note on percussion and appear tense. As the oxygen reaches the subcutaneous layer, the bronze colouration changes to a bright rosy pink. As a rule, it was found that one complete operation was sufficient to check the infection. If, however, extension was evident, 24 hours after the infiltration, the operation was repeated. In all cases two operations sufficed to bring about the required result.

Inasmuch as the disease is produced entirely by anaerobic organisms, it is more than probable that *infiltration of the tissues with air alone* would produce conditions inimical to the development of the bacteria. The investigation of this point is important owing to the expense involved in employing pure oxygen and the limitation of treatment by this method to the fixed hospitals.

The matter was under consideration when the writer of this note returned from France in August, 1915.

(BECKWITH WHITEHOUSE.)

ABSTRACTS.

LARYNGOLOGICAL.

WARFARE INJURIES OF THE EAR, NOSE AND THROAT.

Wound of Neck and Larynx (Proc. Roy. Soc. Med. Laryng. Section March to June, 1915). A gunshot wound of the neck, with injury to the larynx, in which the glottis was closed by the formation of a crescentic web occupying its anterior half. The ventricular bands were thickened. Both arytenoids had equal and almost complete movement; possibly the left was a little more free than the right, except that adduction left a chink in the posterior one-third of the glottis. The opinions expressed at the meeting were in favour of no interference with the condition.

A gunshot wound of the neck, with extensive injuries to the larynx.—There was a swelling at the level of the thyroid cartilage, in the right anterior triangle, which eventually resulted in suppuration, and was opened and drained. An X-ray examination showed no sign of a foreign body. On examination by the laryngoscope no vocal cords were to be seen; the regions of the ventricular bands, especially the right, being occupied by masses of granulation tissue. No treatment was advised until the perichondritis had subsided.

A shrapnel wound of the neck, with injury to the buccal cavity, with exit beneath the jaw on the opposite side.—Wounds in the thigh and occiput had healed, and gave no trouble. The injuries to the mouth might have been occasioned by the blowing in of the trench. The X-ray examination of the neck had not yielded evidence of a foreign body.

A shrapnel wound of the face, in which the ball had traversed the face from one cheek to the other, passing through

the nose.—During the healing of the wound the nasal cavity became blocked by masses of scar tissue, and respiration was conducted almost entirely through the mouth. The synechiæ in the nose were treated by diathermy with Schall's small apparatus, and the result had exceeded expectations. There was an entire absence of reactionary swelling, and the cicatricial tissues showed no sign of forming again. A point was raised whether diathermy was justifiable in such a condition as this, and the opinion was expressed that there had been no necessity to interfere further, as there had been a subsequent slow removal of redundant scar tissue, as the result of coagulation necrosis—an important part of the diathermy process.

Functional aphonia in two cases, following the bursting of a shell in close proximity to the patient, accompanied in one by functional deafness.—In neither could any other disease be found, and enquiry showed that the voice was strong before the accidents. The voice and hearing were restored by intralaryngeal faradic shock. The general condition might be described as that of profound neurasthenia.

Gunshot wound of the neck, with laryngeal symptoms.—There was left-sided paralysis of the cervical branches of the facial nerve producing drooping of the angle of the mouth. There was also left unilateral paralysis of the hypoglossal nerve, which caused deviation and twisting of the tongue. The true vocal cords did not approximate on phonation, nor did they move during breathing, but the arytenoids approximated during phonation. There was a slight amount of anæsthesia on the left side of the soft palate.

In four cases of functional aphonia the voice returned on asking the patient to phonate with the laryngeal mirror *in situ*, and a mild application of the faradic current was effective in two other cases.

Functional aphonia coming on suddenly in the trenches without any injury.—At the discussion which followed the exhibition of cases attention was drawn to the importance of excluding pulmonary tuberculosis in cases of functional aphonia.

The men most often affected by bad weather or noise at the Front had almost always old aural trouble or nasopharyngeal disability.

Milligan and Westmacott (Proc. Roy. Soc. Med., Laryng. Section, June, 1915) read a paper as an introduction to a discussion on injuries to the nose, sinuses and throat incidental to war. They were impressed by the comparative immunity from septic complications in these cases and attribute this in part to the absence of clothing in these particular regions and to the consequent non-contamination of the wound, and also to the fact that the tracts of infection in many instances have communicated with the external air by way of the nasal passages, the mouth, the larynx, etc., a circumstance unfavourable to anaerobic infection. The bullet had passed through the head or face in many cases without the splintering and severe comminution seen in other regions, owing to the thinness and more brittle character of the bones of the face. Free drainage and the use of the antibacterial properties of the tissue fluids were the means encouraged. Deeply embedded bullets or pieces of shrapnel, in the absence of complications, were left alone, while those which were superficial and accessible were removed. Wounds with severe laceration and septic tracts were opened up in every direction and irrigated with antiseptic lotions, especially hydrogen peroxide, and a free flow of lymph encouraged by lavage, baths, etc.

In injuries to the nose and nasopharynx the arrest of hæmorrhage was the immediate anxiety, and the remote one the best plastic operation. In one case of severe hæmorrhage the nasal passages were carefully cleansed, fragments of necrosed bone removed and large doses of ernutin ordered, with satisfactory results. The finger of a disused rubber glove packed with gauze was used as a splint to maintain a free passage through the nose in comminuted injuries, and in depressed fractures of the bridge of the nose some form of plastic operation is required. Injuries to the larynx resulted in perichondritis and œdema requiring tracheotomy in certain cases, but were comparatively rare. Cases of direct nerve injury present no

particular difficulties, but loss of sight, speech, hearing, or memory without any objective evidence of damage is a problem of real moment. Many recover under favourable and quiet conditions. The abrogation of function is regarded as due to a temporary suspension of neuron impulses from the higher cortical cells to the periphery and that the interference is a central one. In cases of so-called concussion deafness the presence of previous ear disease is noticeable, and has tended to throw the effects of the concussion more upon the sentient than upon the conducting segments of the organs of hearing. The laryngeal examination of soldiers who have suddenly lost the power of speech shows no paresis of the adductors alone, but, as in hysterical aphonia, a total inability to put the vocal cords in motion, evidence of the central origin of these functional disturbances. Such cases do well with rest, strychnine, and a judicious mixture of auto-suggestion and encouragement.

OPHTHALMOLOGICAL.

THE RELATION OF THE EYES TO RIFLE SHOOTING.

RODERIC O'CONNOR (*Ophthalmology*, July, 1915) has an instructive and exhaustive article on the ocular functions involved in shooting and their relations as regards sighting and estimation of distance. The article should be read in the original by all surgeons who have to examine recruits and by all who are interested in shooting. We give here a *résumé* as given by the author.

SUMMARY OF FACTS.

1. The necessity of focussing the three points—target, front and rear sights, and,
2. The ability to rapidly make the necessary change of focus from one to another of these three points.
3. Alignment once being secured :
 - (a) The sights furnish the diffusion images—being seen by indirect vision.

- (b) The bull's-eye, more especially its lower edge, is seen clearly and by direct vision.

SUMMARY OF ESSENTIALS NECESSARY FOR BEST RESULTS.

1. Normal distant vision in order to—
 - (a) Allow of locating accurately the mark.
 - (b) Assist in distance estimating.
2. Sufficient accommodative power to allow of a clear focusing of rear sight.
3. Normal colour perception as an aid in—
 - (a) Locating the object.
 - (b) Perceiving details.
 - (c) Estimating distance.
4. Binocular vision in order to estimate distances more accurately.

OPTICAL AIDS TO MARKSMANSHIP.

A. Black sights to prevent blurring by irradiation of light from them.

B. Lenses.

1. Those correcting refractive errors must be absolutely accurate and best prescribed after refraction under atropine mydriasis as a more accurate correction of any astigmatism is thus obtained. The best method is to correct all the astigmatism and then give the spherical correction, while case is sighting at a mark, with the rifle, up to the clearest view of the mark. This allows for the fact that in aiming one cannot look through the optical centre of the lens as ordinarily placed and also for the fact that refraction is different through the periphery of the lens.
2. Amber lenses are of value—
 - (a) By diminishing glare, thus preventing tiring from excessive contraction of the pupil.
 - (b) By cutting out to a great extent the irritating actinic rays of light.
 - (c) By lessening the irradiation of white portion of target over the bull's-eye thus allowing the latter to stand out clear, sharp and apparently larger.

- (d) By not cutting down to any noticeable extent the actual illumination.
- (e) By assisting in bringing out slight contrasts in shades of green, which are those chiefly encountered in nature, and consequently on dull days everything is actually brightened.

C. Rear sights.

1. Disadvantages of present rear sight—

- (a) The necessity of aligning three points.
- (b) The necessity of accommodating to see it which is a strain even to the normal, and impossible for the presbyopic eye.
- (c) The comparatively short distance between the two sights, thus lessening accuracy of aim.
- (d) The difficulty in rapidly finding point of aim and front sight through the peep due to the fact that it affords, through it, a field of vision of but one foot for each 100 yards of range.

2. Advantages of peep sight close to the eye.

- (a) Only necessary to align two points, target and front sight, the mere act of looking through the peep aligning it.
- (b) No strain put on the accommodation as it becomes unnecessary to focus even the front sight, hence presbyopes have no difficulty.
- (c) The corrective effect of the small aperture on spheric aberration and circles of diffusion, thus aiding those who have reduced vision.
- (d) Allows of more rapid aiming because of advantages (a) and (b) and because a much greater field of vision is permitted. A one-millimetre aperture one inch from the eye affords a field of about eleven feet per 100 yards of range. In addition no time is lost finding the rear sight. With the sight one-half inch from the eye the above field would be doubled.
- (e) Increased accuracy of aim because of greater distance between sights.

- (f) Reduction in amount of glare.
- (g) Prevention of side views and lights.
- (h) The possibility of incorporating amber glass or correcting lens with sight, thus insuring accurate and permanent centreing.

The problem of locating the peep sight as recommended is one for ordnance experts, but optically there is no doubt whatever but that the place for it is as close to the eye as possible. It would be simplified by omitting the knurled cocking head and by lengthening the stock which at present is too short for the average man. This shortness produces too much bend at the wrist for the free play of the tendons of the forearm muscles, for it must be remembered that the trigger-pulling muscles are in the forearm.

With the distance between sights so greatly increased the barrel could be shortened and still maintain the present accuracy. This would be of advantage to the cavalry arm. The alteration necessary to place the sight where recommended may be considerable, but every consideration, of drill, etc., should give way to an increase in the usefulness of the rifle.

RECOMMENDATIONS AS TO VISUAL REQUIREMENTS.

1. For the line of the army, the signal and engineer corps.
 - (a) 20/20 in each eye.
 - (b) Binocular vision.
 - (c) Normal colour perception.
 - (d) Sufficient accommodation to allow a clear focus at 8 inches from the eye—this does away with the necessity of setting a limit to the degree of hyperopia for different ages.
 - (e) Eyes must be free from disease and from asthenopia.

2. For officers, cadets, hospital corps, ordnance, subsistence and quartermaster's departments any degree of defect in either eye *provided* there is no *ocular diseases* and that *normal distant and near vision* may be secured by the use of *proper correcting lenses*. These various classes do not take part in firing in battle, consequently there is not the same need for

normal eyes and besides they are in a better position to take care of lenses. It requires but a low degree of myopia to greatly reduce distant vision, while a high degree of hyperopia, which is more apt to cause headaches, etc., may be overcome, in the young, by the accommodation, and yet at the end when the accommodation fails the vision is reduced to the same extent as in myopia. *A young officer wearing glasses for myopia is just as useful as an old one wearing them for hyperopia.* Finally officers are required to carry field glasses and so are not helpless in case they lose or break their glasses.

SOMETHING ABOUT THE EYE SYMPTOMS IN RAYNAUD'S DISEASE. (Etwas ueber Augensymptome bei der Raynaudschen Krankheit. *Bericht der Ophthalmologischen Gesellschaft*, Heidelberg, 1913, p. 278.)

BLAAUW had a patient, a woman of 28, who had suffered from chronic conjunctivitis associated with staphylococci which had troubled her for five years. She had attacks of pain in the eyes, accompanied by diminution in her power of vision. Both Blaauw and her previous medical attendant found a different state of refraction every time they examined her. The visual acuity varied from 5/18 to 5/5. She was an anisometrope with decided astigmatism in the left eye. Blaauw suggests that the astigmatism may account for the fact that the attacks of poor vision are always more marked in the left eye. The patient had suffered from "dead fingers" during the period under notice. Blaauw seeks to associate the eye symptoms with this local syncope. No details of the refraction are given, and we are not told whether the eyes were examined under a mydriatic, so that it is quite impossible to express any opinion upon this suggestion. The author summarises the scanty literature which bears upon the association between Raynaud's disease and eye symptoms. Raynaud described a contraction of the retinal vessels which occurred when the fingers became cold. Batten has published a similar observation. But other ophthal-

moscopists have failed to detect any such changes in calibre. Blaauw criticises these negative findings, because insufficient details are given. He himself gives no details of the ocular condition in his example, and does not mention the appearance of the fundus.

T. HARRISON BUTLER.

UPON THE CAUSAL CONNECTION BETWEEN
RETINAL DETACHMENT AND ACCIDENT. Ueber
den ursächlichen Zusammenhang von Netzhautablösung
und Unfall. *Zeitschrift für Augenheilkunde*, Januar,
1914).

PERLMANN, of Iserlohn, discusses, from the standpoint of Compensation Acts, the relationships which exist between retinal detachments and accidents. He decides that :—

1. Accidents associated with perforation of the eyeball can cause detachment, whether the eye be disposed to the catastrophe or not. In this case the causal connection can hardly be disputed.

2. If a detachment is caused by a new growth we can almost always say that the tumour was not caused by the accident.

3. Contusion of the globe never causes detachment in a previously sound eye.

4. There are a certain number of individuals who on account of ocular or general diseases are always threatened with detachment. This occurs spontaneously when the disease has advanced sufficiently, without the action of any external force.

5. If it can be shown that detachment immediately follows an accident, the responsibility of this accident for the detachment must be admitted in spite of serious scientific objections.

6. Mere strain during work must never be held to be a cause of retinal detachment.

T. HARRISON BUTLER.

REFLEX OCULAR DISTURBANCES DUE TO IMPACTED THIRD MOLARS.

DUTROW (*Ophthalmic Record*, May, 1915) describes an interesting case of severe ocular and general disturbance arising from impaction of molar teeth. The symptoms were severe headache, followed by vomiting, which relieved the headache temporarily. Complete paralysis of the left external rectus muscle, and elevation and rotation inwards of the right eye due to spasmodic contraction of the superior rectus and the superior oblique. The fundi were normal. There was no specific history and the Wassermann reaction was negative. Skiagrams showed impaction of the third molars, which were so situated that eruption was a physical impossibility. Within a few days after the extraction of the erring molars the patient was improved generally, and within a month all the ocular and general symptoms had entirely disappeared. Previous to the discovery of the impacted molars treatment by glasses and strychnine and the resection of a deflected nasal septum had been tried unsuccessfully.

ACUTE AND CHRONIC RETROBULBAR NEURITIS.

DR. ZENTMAYER (Philadelphia Polyclinic Society) detailed the symptoms of the two varieties and emphasised the fact that the phenomena of the acute did not present the constancy of the chronic type. The differential etiological diagnosis presented many difficulties. In the acute type the existence of the enlarged blind spot together with a central scotoma would indicate a sinusitis. A sudden marked loss of vision with an early sign of either obstruction to the central retinal circulation or beginning papillœdema would be suggestive of an intravaginal hæmorrhage. A similar onset with associated papillitis would indicate an orbital affection. Involvement of one of the ocular muscles with considerable retrobulbar pain would point to periostitis. These points concern only the ocular symptoms. The diagnosis is aided by the history, the results of laboratory tests and roentgenology.

In the chronic retrobulbar neuritis if the scotoma is absolute and transient and there is a marked discrepancy between the field findings and the ophthalmoscopic changes, disseminated sclerosis would be indicated. Uhthoff holds that a differential diagnosis between tobacco and ethyl alcohol amblyopia cannot be made from the ocular symptoms. However, in the presence of retinal hæmorrhages, which occur in some cases and other signs of retinal angiosclerosis, it is probable that in a mixed toxæmia alcohol has been the most important factor in the case.

The question of the relation of arteriosclerosis to tobacco-alcohol amblyopia is of considerable interest. Among those who have specially called attention to it is Scalinci. The age at which amblyopia due to these agents occurs, that there is often a marked difference in the degree of involvement in the two eyes, that blood pressure is often much increased, that there are evidences of widespread arteriosclerosis, are points brought forward by this author. Kruger has found evidences of retinal sclerosis involving principally the macular twigs in most cases. To these findings I would add retinal hæmorrhages, which I found in at least three cases.

As to the explanation of the phenomena of retrobulbar neuritis, several theories are advanced to explain the nyctalopia, the most plausible being that the production of the visual substance can more readily keep pace with its expenditure in subdued than in bright light. The biologic axiom of Erdinger "that a high degree of functional activity involves an increased morbidity" has been suggested as the cause of the susceptibility of the papillomacular bundle to toxic agents. A second theory advanced is the poorer supply of blood to the macular region, and a third reason given is that the cones are connected with the polar cells by only one fibre, whereas the rods have several.

It is interesting to note that Ronne's anatomic findings in several cases of tobacco-alcohol amblyopia indicate that the process is a degeneration of the papillomacular bundle and not an interstitial infection.

In alluding to the treatment of this affection Dr. Holloway stated that he thought there were no ocular affections where the symptoms might be more alarming to the patient than in the acute form of this disease. Owing to the fact that the etiologic factor is often obscure, patients could be better treated if they were placed in an institution where they could be promptly and thoroughly investigated. Owing to the conspicuous role that has been assigned to the accessory sinuses in the production of eye disease, one would naturally insist upon a thorough examination of these structures, and in the event of positive findings prompt and efficient treatment of the same. The same would apply to investigations of the mouth and pharynx. In fact, eliminative treatment in this disease is essential whether it is brought about by means of surgical intervention or stimulation of various physiologic functions, such as diaphoresis. For the latter Dr. Holloway prefers the cabinet bath, although pilocarpin or the older method of blankets and hot water bottles might be resorted to. Mercury and iodides would of course be exhibited in those cases where these remedies were especially indicated, but even where such was not the case, inunctions of mercury could well be used, because it was so frequently of service in ocular conditions that were not of specific origin. Sodium salicylate has also proven of service, as has local irritation sometimes applied behind the ear.

As to the chronic affection, the first thing that would suggest itself would be the immediate removal of the patient from contact with toxic substance. As far as alcohol and tobacco were concerned, the use of these should be completely stopped and the patient should be cautioned that one cigar or one drink a day might be sufficient to perpetuate the disease. Owing to the frequency with which the use of these drugs is accompanied by disturbances elsewhere in the body, any co-existing affections must receive attention. In the chronic type sweats would prove of the greatest service. For its tonic effect strychnia, either by the mouth or hypodermically, beginning with 1/30 of a grain, should be administered.

Dr. Holloway has never had occasion to resort to brucine, neither has he had any experience with thiosinamine. He had used this latter drug some thirteen years ago for conditions other than those existing in the eye, and had never seen the slightest benefit from its use. He has had but little experience with the use of electricity in the treatment of nerve atrophies. In a recent case where the high frequency current had been used for a rapidly progressing atrophy occurring in tabes, its use had been disastrous.—(*Ophthalmic Record*, May, 1915.)

NOTES AND NEWS.

UNIVERSITY OF BIRMINGHAM.

THE winter session of the Faculty of Medicine and School of Dentistry will open on Tuesday, October 5th, 1915.

Mr. J. Sholto C. Douglas, M.A., D.M., B.Ch. (Oxon.), M.Sc. (Birm.), has been appointed to the John Hunter Chair of Pathology in the University of Sheffield.

ROYAL ARMY MEDICAL CORPS.

THE following announcements have recently appeared in the *London Gazette*.

3rd North Midland Field Ambulance : Captain Bertram M. Footner, from Attached to Units other than Medical Units, to be Captain.

South Midland Field Ambulance : William George McKenzie to be Lieutenant.

South Midland Field Ambulance.—W. J. F. Craig to be Lieutenant (August 27).

2nd South Midland Mounted Brigade Field Ambulance : To be Captains : Lieutenant Alexander Rodger and Lieutenant John C. S. Dunn.

South Midland Division (Sanitary Section).—W. H. Davison, M.B., to be Lieutenant (June 10).

Army Medical Pay and Allowances.—We regret that we omitted to mention that we were indebted to the Editor of the *Midland Medical Journal* for the article on this subject in our August number.

NEW CENTRAL SCHOOL CLINIC FOR BIRMINGHAM.

THE value of the medical inspection and treatment of school children has become increasingly appreciated during the last few years ; and to-day, with the enormous wastage of life at the front, the importance of the work is too obvious to need emphasis. It is, indeed, scarcely an exaggeration to say that the next most important thing to our winning the war is that we should make good the losses in the present generation by providing the means for securing a healthy succeeding generation. Never has the need for a strong future generation been greater ; never, therefore, has the work of the school clinics of the Birmingham Education Department—the eighth of which is to be opened in Great Charles Street next week by Sir George Newman (Chief Medical Officer of the Board of Education)—been more urgently necessary.

The opening of the new clinic represents the completion of a scheme for supplying with a clinic each of the eight divisions into which the city has been divided for school medical purposes. It will be the largest and most central of the eight, and the only one specially designed for the work of inspection and treatment. For X-ray treatment of ringworm and for special eye cases it will serve the whole city, but for the treatment of minor ailments the area it will cover comprises the thirty central schools, which have an average attendance of about 20,000. It consists of three floors. On the ground floor is a large waiting room for parents, an office for clerical work, a dressing room in which the children will disrobe before going before the medical officer in the adjacent room, a room for the treatment of minor ailments, and the X-ray room, where two sets of apparatus, which can be operated by one radiographer, are to be installed. Intractable cases of ringworm are at present being dealt with at the Dudley Road Infirmary. At the new

clinic it is proposed at first to deal with the cases on two half-days per week, enabling about 18 children to be treated each week.

On the first floor work in connection with the examination of the eyes and the prescription of spectacles will be carried out, and the disposition of the rooms is almost identical with that on the ground floor. In the parents' waiting room, however, is an object which has been placed there in accordance with a suggestion by the chairman of the Hygiene Sub-Committee (Mrs. George Cadbury). This is a cooking stove. The treatment of individual eyesight cases often occupies an hour or more, and it is proposed to give the waiting mothers—or those who care to avail themselves of the opportunity—practical demonstrations in economical cookery. This will be done voluntarily, and the committee are anxious to get into touch with a number of sympathetic public-spirited women who will attend on various days to give the lessons. It is also hoped to arrange a series of health talks to be delivered by assistant school medical officers and nurses. The top floor covers only a portion of the site area, and consists of two spare rooms, one of which will, until further developments, be used as a common room by the staff. Owing to the flat roof which completes the unoccupied part of the ground and first floors, it will be possible at any time to extend the top floor without difficulty.

There is no accommodation for dental work on the premises, but arrangements have been made to rent the first floor of the Dental Hospital, which is next door, where there will be two chairs with two surgeons in attendance every afternoon. A door connects the first floors of the two buildings.

The staff will consist of an assistant school medical officer, two nurses, a radiographer, and the part-time services of one or two nurses to assist him, two part-time ophthalmic surgeons, and three or four clerks. The cost of the building and its equipment comes well within £4,000—viz., erection of the clinic, £3,485; X-ray apparatus, £209; furniture and fittings, £170. This expenditure was embarked upon before the outbreak of war.—*Birmingham Daily Post*.

THE EFFECT OF THE WAR ON HOSPITAL WORK.

THE SHORTAGE OF DOCTORS.

THE annual meeting of the governors of the West Bromwich District Hospital was held on Saturday afternoon, under the presidency of Colonel G. Walton Walker.

The Board of Management reported that the local number of in-patients treated was : General Department 837, and Eye Department 107, compared with 891 and 116 respectively the previous year. The average cost per bed occupied was £68 14s. 10d., and the average cost per in-patient was £4 3s. 3d., as against £56 7s. 9d. and £3 4s. 7d. respectively the previous year. This increase has been brought about by the considerable advance in the price of provisions, surgical dressings, and appliances, owing to the war, by the necessity of having to engage the services of locum tenentes at high salaries in consequence of the shortage of medical men, who in the ordinary course of events would be available for the positions of house surgeons, and by the advances which have had to be made in the salaries paid to the nursing staff in order to maintain the full complement of nurses. The cost per bed occupied was, for the second year in succession, lower than any other hospital in the kingdom, while the average cost per in-patient had been the lowest for three years in succession. The total number of new out-patients treated was 7,539, as against 8,392 the previous year, a decrease of 853, mostly in the Accident Department. The figures for the Eye Department showed an increase of 117, the number treated being 3,602. The total subscriptions for the year, including the amounts received from the local education authorities, had been £903 19s., as against £804 17s. 9d. last year. The amount paid over by the Hospital Saturday Committee was £2,804 10s. 6d., against £2,570 19s. 2d. During the year the sum of £2,851 7s. 6d. had been received as the proceeds of the floral bazaar, and in accordance with the wishes of the Bazaar Committee £1,000 had been paid to the Endowment Fund towards the cost of endowing the " King Edward VII. bed " ; £1,000 had been placed on deposit, and £851 7s. 6d. paid to the deficiency account. The ordinary expenditure for the year amounted to

£5,439, against £4,614 the previous year. Including extraordinary expenditure, the excess of expenditure over income for the year was £949 15s. 10d.

The report was approved, on the motion of the Chairman, who mentioned that they had had a number of Belgian and British wounded soldiers under treatment in the institution.

Viscount Lewisham, M.P., was re-elected president, Mr. F. T. Jefferson, hon. treasurer, and Mr. T. F. Bache honorary secretary. The latter mentioned that owing to the difficulty of maintaining their medical staff because of the demands of the war, they had got a house surgeon of Chinese nationality, who came with the highest credentials from English doctors in Shanghai and at Edinburgh.

The Chairman stated that under the will of the late Mr. Archer Sutton, the hospital would in the course of a few years receive a legacy which would amount to over £10,000.

WOLVERHAMPTON HOSPITAL AND THE EMERGENCY.

AT a special general meeting at Wolverhampton, of the Board of Governors of the Wolverhampton General Hospital, the following resolution was passed unanimously :—“ That upon the recommendation of the Board of Management, until otherwise resolved, and in consequence of the present emergency, the rules, regulations, and bye-laws now governing the administration of the hospital be suspended ; and that the Board of Management be authorised to make such other further rules, regulations and bye-laws as in their discretion they may consider necessary for the efficient conduct and management of the hospital.”

Mr. T. B. Adams, who presided, said the board wished to be in a position to avail themselves of the services of men who were fitted to do certain work should occasion arise. They thought the most expedient way of securing the desired end was to ask the governors to place confidence in the Board of Management, and to suspend all rules and regulations for the time being. The resolution would not be so drastic as appeared on the face of it. Since the outbreak of the war the hospital had been

conducted under exceptional difficulties. There was a shortage of medical men, and he held the opinion, which he believed was shared by hospitals throughout the country, that for some months there would be an even greater shortage of medical men to fill the posts of residents in hospitals. Like the War Office the Board of Governors were bound by red tape, but following the example of Mr. Lloyd George in his position as Minister of Munitions, they desired to get rid altogether of red tape, and to fight the battle of disease with all the means at their disposal. He could not but state that their honorary staff had risen nobly to the occasion, their attendance at the hospital in the evening in a regular rota being practically compulsory. To them and to the honorary surgeons also the board were indebted for the way in which they had helped the hospital, so that the out-patient department and the surgical side had been kept open during the whole period of the war.

Mr. F. T. Langley seconded.

The resolution was carried without a dissentient.

—*Birmingham Daily Post*.

DEATHS AMONG THE SONS OF LOCAL MEDICAL MEN.

THE following sons of medical men practising in the district have to be added to the number of those who have fallen during the war :—

Captain John Theodore Spencer Weston, the younger son of Dr. Darby Weston, of Handsworth, was killed in action in France on the 20th of August. He was twenty-three years of age and was attached to the 1st Battalion of the Royal Berkshire Regiment. He went out to France a few weeks after the outbreak of war, and had taken part in numerous engagements, had been mentioned in despatches, and received the military cross for conspicuous bravery on the field. He was in the final year of his medical course at the Birmingham University when the war broke out.

Captain E. G. Harries, 1st Royal Welsh Fusiliers, younger son of Dr. T. D. Harries, of Aberystwyth.

BOOK REVIEWS.

The Poison War. By ALFRED A. ROBERTS, *Member of the Chemical Society of France; Member of the Society of Chemical Industry, etc.* London: William Heinemann; 1915. Price 5s. net.

THIS book contains "a description of the poisonous and asphyxiating gases now being used by the Germans—their nature and composition, the machines by which they are projected, both on land and at sea, and the means taken to neutralise their effects; together with sections on the various explosives used in modern warfare." It is evident that the information it contains is of paramount interest and value to all medical men who have to deal with wounded and gassed soldiers from the front. The profession has been much exercised in its mind as to the nature of the poisonous gases which the enemy has used with such distressing effects. The author of this work seems to have acquired a good deal of "inside" knowledge of the German poisoning methods and the information which he retails in this book cannot fail to be of extreme interest both to the medical profession and the general public. He shows that from the very beginning of the war the allied troops have been systematically poisoned in a variety of ways. He further brings out that this hideous crime is not an expedient hurriedly adopted as a last and desperate resort to stem the tide of disaster, but was the outcome of a deliberate and cold-blooded design and experimentation carried out with characteristic thoroughness and completeness by the Germans the while they were signatories to an international agreement prohibiting the use of asphyxiating gases in warfare.

Poisoned shells, poisoned bullets, liquid fire, explosive and incendiary bombs, as well as the legitimate projectiles and mines used in the present war are described in an interesting and in-

structive manner. Interspersed with these technical details there is a good deal of historical information relative to the laws and customs of warfare ancient and modern, and the relative losses in various campaigns and battles. In the appendices extracts from the Hague Convention (No. 4), 1907, are given and indicate very clearly the perfidious duplicity of the Germans during these years of discussion and agreements on the customs of civilised warfare. The subject matter, though not very methodically arranged, is both entertaining and instructive throughout, and the perusal of the work by the general public will certainly tend to stimulate recruiting. For the medical profession it contains many useful hints apart from specific information as to the nature of the poisons used in this war.

A Manual of Chemistry. By ARTHUR P. LUFF, M.D., B.Sc., F.R.C.P., F.I.C., and HUGH C. H. CANDY, B.A., B.Sc., F.I.C. Fifth edition. London: Cassell and Co., Ltd. 1915. Price 8s. 6d. net.

THE fifth edition of this familiar work is a great advance on previous issues. In our review of the fourth edition we stated that "it is a matter of regret that Mr. Candy in revising this book did not see his way to recast the whole of the first part so as to bring it into harmony with the modern methods used in most of the colleges and the universities, both in this country and abroad." We are glad to note that in the present edition these shortcomings have in a great measure been rectified. Due attention is given to the elucidation of the fundamental principles of chemistry, and physical chemistry is given more adequate recognition.

The general outline of the manual remains the same, but numerous alterations and additions have been made in the text to bring the work abreast of modern requirements and developments.

As a concise treatise "on those portions of chemical science that directly or indirectly bear on the study and practice of medicine," the book is admirably suited to meet the wants of medical students.

Evolution and Disease. By J. T. C. NASH. Bristol : John Wright & Sons, Ltd. ; 1915. Price 3s. 6d. net.

THIS work is based upon the Chadwick Lectures delivered by the author in 1913. The purport of his treatise is to show that "it is possible that some diseases which can now be differentiated as distinct diseases may at one time have been less clearly distinct." He shows that the character and properties of bacteria are not of that permanent and fixed type that we associate with the more highly developed plants and animals. He derives evidence to support his views from a wide field including epidemiology, bacteriology, philosophical induction, and clinical observation. Whether it is true or not that saprophytic organisms under certain conditions may be transformed into definite and well recognised pathogenic organisms, there can be no doubt that the clinical and pathological effects of organisms, are liable to variations, and that specificity of disease can only be regarded as a relative term. The author also touches on the questions of heredity and disease, the declension of phthisis, the evolution of sanitation and war as a factor in the evolution of epidemics. The first three chapters dealing with the historical records of plagues and epidemics in the Middle Ages are highly entertaining, and throw a good deal of light on the causes and development of these pestilential scourges which afflicted the people of this island in earlier times. The work is written in a pleasant style and forms interesting and highly instructive reading.

BOOKS RECEIVED.

From Macmillan & Co., Ltd., London—

Diseases of the Arteries, including Angina Pectoris. By SIR CLIFFORD ALLBUTT, K.C.B., M.A., M.D., F.R.S.
In two volumes. Price 30s. net.

Alcohol and the Human Body. By SIR VICTOR HORSLEY, F.R.S., F.R.C.S., and MARY STURGE, M.D. Price 1s. net.

From William Heinemann, London—

The Poison War. By ALFRED A. ROBERTS, M.C.I. Price 5s. net.

Fibrositis. By LL. JONES LLEWELLYN, M.B., and A. BASSETT JONES, M.B. Price 25s. net.

From E. & S. Livingstone, Edinburgh—

Text Book of Forensic Medicine and Toxicology. By R. J. M. BUCHANAN, M.D., F.R.C.P. Eighth edition. Price 7s. 6d. net.

Botany. Part II. Catechism Series; Second Edition. Price 1s. net.

From John Bale, Sons & Danielsson, London—

On the Prevention of "Frostbite" and Other Effects of Cold (Froidure or Frigorism). By PROFESSOR S. DELEPINE.

Squint. By CLAUD WORTH, F.R.C.S. Fourth edition. Price 6s. net.

From Cassell & Co., Ltd., London—

Diseases of the Nervous System. By H. CAMPBELL THOMSON, M.D., F.R.C.P. Second Edition. Price 10s. 6d. net.

From John Wright & Sons, Ltd., Bristol—

An Index of Prognosis and End Results of Treatment. By many writers; edited by A. RENDLE SHORT, M.D., B.Sc., F.R.C.S. 21s. net.

An Index of Treatment. By various writers; edited by ROBERT HUTCHISON, M.D., F.R.C.P., and JAMES SHERREN, F.R.C.S. Seventh edition. Price 21s. net.

The British Journal of Surgery, Vol. III., No. 9. Price 7s. 6d.

Medical Annual Synoptical Index, Vol. III. Price 8s. 6d. net.

From H. K. Lewis & Co., Ltd.—

Health in the Camp; A Talk to Soldiers. By LIEUT.-COL. H. R. KENWOOD, R.A.M.C. 21s. 100 copies. Price 3d. net.

THE BIRMINGHAM MEDICAL REVIEW.

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INDUSTRIAL DISEASES CAUSED BY LIGHT, AND THEIR PREVENTION.

By T. HARRISON BUTLER, M.D. (Oxon.), *Assistant Surgeon to the Birmingham and Midland Eye Hospital; Hon. Ophthalmic Surgeon to the Coventry and Warwickshire and to the Warneford, Leamington, and South Warwickshire General Hospitals.*

IN many trades the workers are exposed to light which by virtue of its intensity or character may cause injury to the eye. The evil effects fall into three groups: Those caused by severe glare; those due to the action of the infra-red heat rays; and those occasioned by the ultra-violet radiation. The noxious action of the X-rays lies outside the scope of these remarks.

Exposure of the eye to a very intense light, such as direct sunlight or a short circuit flash, causes very characteristic symptoms. After every eclipse cases of blindness appear at the eye hospitals within the area of visibility. The disease is caused by observing the sun with the naked eye or through a telescope, without the intervention of a smoked glass of suitable density. Central vision is much reduced and a positive scotoma is generally present. The cases often recover, but if the insolation have been intense the loss of acuity may be permanent. A short circuit of a conductor carrying a high voltage may have similar effects, but the scotoma is complicated by intense conjunctivitis, and occasionally by cataract. The scotoma is caused by coagulation changes at the macula. In some cases these alterations can be detected with the ophthalmoscope.

The prolonged action of great heat is just as deleterious to the eye as intense light, but it attacks the lens. Dr. W. Robinson, of Sunderland, was one of the first to describe a peculiar form of cataract, which affected bottle makers with extraordinary frequency. His paper was published in the *British Medical Journal* in 1907. The late Mr. Simeon Snell denied that bottle makers were unduly liable to cataract, but Robinson's classical description of the disease has been fully confirmed, and is now universally accepted. The opacity always commences in the pupillary area of the lens deep down near the posterior pole. Ultimately it becomes generalised, and the cataract cannot be distinguished from the ordinary senile type.

Sir William Crookes has shown that no X-rays, and few ultra-violet rays are emitted from the surface of molten glass. The light is very rich in infra-red rays, heat rays, which appear to be the cause of cataract. These rays are entirely absorbed by the iris, a fact which explains the central position of the opacity in the lens. The disease is not confined to bottle makers; it is found in puddlers and other men who are exposed to the glare of molten metal and glass. Dr. Robinson brought a case of bottle maker's cataract to the Oxford Ophthalmological Congress, which was held in July. Mr. Bernard Cridland, of Wolverhampton, showed a puddler who had the cataract in its typical form.

We have seen that light of excessive brilliancy attacks the retina, and that the infra-red rays act upon the lens. A third class of rays cause inflammation of the lids and conjunctivæ. The ultra-violet rays cannot pass through the lens, they are absorbed by it, and cause fluorescence. These radiations are the cause of snow-blindness, and an exactly similar disease called *ophthalmia-electrica*. A workman exposed for long to a source of light rich in ultra-violet rays is liable to a painful conjunctivitis; slight attacks of chronic irritation of the conjunctivæ may be traced to these rays, which are emitted from ordinary metallic filament lamps.

The mercury vapour lamp, and especially the quartz mercury vapour lamp, emit a light which contains the maxi-

mum of violet and ultra-violet rays. The iron arc follows the mercury lamp as a potent source of these rays, and the ordinary carbon arc is almost equally powerful in this respect. The metallic filament lamp and the incandescent gas mantle emit a considerable amount, but the ordinary bat's wing and the paraffin flame are poor in ultra-violet rays. The old-fashioned moderator, burning colza or sperm oil, gives an illumination which is almost free from these radiations.

The mercury vapour light and the arc light are highly actinic, and are in consequence used in process block making and other photographic operations. The workers, with these illuminants, are liable to ophthalmia-electria unless adequately protected. A short circuit flash is a blaze of light of short wave lengths, and gives rise to this form of ophthalmia in addition to its action upon the retina. Electric welders are exposed to the iron carbon arc, an intense glare rich in violet and ultra-violet radiations. These men, unless well shielded, suffer from the same symptoms.

It is obviously essential that workers exposed to these three types of noxious rays should be adequately protected by suitable goggles if they are to escape the incident dangers. It is equally obvious that the same type of glass is not appropriate to them all. The glass worker calls for a glass which shall exclude glare and heat rays, the electric welder must be shielded from glare, and the Polar explorer and the process block makers demand a goggle impervious to ultra-violet rays. To-day all these needs can be fully met, but we shall see that what is possible is not always practical, nor is the scientific product of modern glass manufacture sufficiently cheap to meet commercial requirements. The workman must be satisfied with a compromise, which, however, in this case appears to be adequate.

Sir William Crookes has attacked the problem from the standpoint of the glass blower, and his researches have given us formulæ which furnish glasses which exclude heat rays and ultra-violet rays to a degree sufficient for all practical purposes. A summary of his work will be found in *Phil. Trans Royal Society*, Series A, Vol. 214, 1914.

In order to examine the question of heat absorption he passed light through a plate formed of a variety of mica known as biotite. This absorbs the short wave length rays completely, but allows the long heat waves to pass freely. These were received upon a special kind of thermometer and upon a radiometer balance. The metals—cerium, chromium, cobalt, copper, iron, lead, manganese, neodymium, nickel, præsodymium, and uranium—were incorporated with a soda flux, and the resulting glasses examined with the balance and thermometer. Ultimately a series was obtained, whose members were classified under three heads: Power of absorbing heat rays; impermeability to ultra-violet radiations; transmission of luminous rays. Cerium was found to be a valuable addition, affording a colourless glass with a high power of absorbing ultra-violet rays. From this series it is possible to choose a glass suitable for every purpose. For a glass blower we should select a glass with a high heat-absorbing co-efficient, whereas Polar explorers would be furnished with a glass which excluded ultra-violet rays. Unfortunately scientific results have been sterilised by commercialism. The demand for these glasses is not great, and it does not pay to make them in small quantities. At present only two formulæ are used, and the two glasses—No. 1 and 2—made by Chance Brothers at Birmingham, are retailed by the American Optical Company at a high price. Neither specimen is at all suitable for the electric welder or glass blower, because the darkest is not nearly dark enough to exclude glare. It would be necessary to combine a Crookes' glass with a neutral glass sufficiently dense for the purpose. The resulting goggle could not be sold for less than eight shillings, whereas the ordinary blue goggle, commonly used, only costs eighteenpence, or less. These are made in France, and for practical purposes are generally sufficiently effective.

Crookes' glass is useful to exclude ultra-violet rays, and would be suitable for Polar explorers and some photographic work.

Euphos glass, a German product, has been used for Polar work and mountaineering with success. Amundsen used it on

his South Polar expedition, and found it efficient, no snow blindness affecting those who used goggles of this glass. Luckeish, however, who examined euphos with the spectroscope, found that it allowed ultra-violet rays to pass in considerable quantity. He advised the use of "akopos" glass, an American product, which we have been unable to procure either in England or America.

Akopos is a greenish-yellow glass, which is, Luckeish says, very suitable for steel temperers, because it does not modify the colour of the metal, which is the factor which guides the workman in estimating the correct moment to quench the heated metal. Amber glass is very efficient in absorbing ultra-violet rays, but it alters the colour of the metal to such an extent that steel temperers cannot use it. Luckeish publishes his investigations in the *Archives of Ophthalmology* for July, 1914. He proposes to combine akopos glass with a neutral glass sufficiently dense to reduce the brilliancy of the metal to a safer degree. The American, however, pays a higher price for his goggles, and in consequence has more effective protection than is afforded to the British workman.

The electric welder's goggles do not last long. They are bombarded by metallic particles, which become embedded, and are found on both sides of the glass. They apparently pass right through the glass! Dr. Edgar Collis showed specimens of such goggles to the Ophthalmological Congress at Oxford in July, 1915. He could not explain how the particles appeared on the reverse sides of the glass. One of my patients who wore spectacles behind his goggles told me that he had to constantly renew his spectacles because they became scratched by the particles which passed through his goggles. It is therefore clear that were a piece of Crookes' glass, combined with a neutral glass, it would require frequent renewal in the case of the electric welder.

We may say, therefore, that the ideal goggle is commercially impossible in this case, but in many others much might be done. Glass blower's cataract could be entirely prevented by the use of a suitable goggle.

REPORTS OF SOCIETIES.

MIDLAND OPHTHALMOLOGICAL SOCIETY.

THE first meeting of the fifth session of the Society was held at the Birmingham and Midland Eye Hospital on Tuesday, October the 5th.

MR. BERNARD CRIDLAND was voted to the chair. The following officers were elected for the session 1915-16 :—

President, Mr. N. C. Ridley; Treasurer, Mr. E. Wood White; Secretaries, Messrs. Jameson Evans and Harrison Butler.

The Treasurer's report was presented and adopted.

The Secretaries reported that all the meetings this session were to be held in Birmingham, with the exception of the June (1916) meeting, which would be held in Cheltenham.

RAY CATARACT.—*Mr. Cridland* showed a case (*vide infra*) of "ray" cataract in a puddler aged 50 years. A cataract extraction had been performed on one eye. The operation had been uneventful, though the lens was exceptionally large, and vision of $\frac{6}{12}$ had been attained. In the discussion of the case it was held that this form of cataract should be regarded as an industrial disease, quite as much as glassblower's cataract, and that "ray" cataract was a better term than "furnace" cataract, in view of the fact that it was often found among chainmakers at Cradley and elsewhere who worked at open fires.

Mr. Harrison Butler showed the following cases :—

GOLF BALL INJURY.—A chemical burn of the cornea and sclera, with subsequent symblepharon. The patient cut into a golf ball and the contents of the "liquid core" had squirted into his eye. The danger of incising golf balls was insisted upon,

and the practice of putting up notices in the golf clubs to that effect was commended. Similar accidents occurring to makers of balls through the bursting of the core-bag was reported.

DERMOID CYST OF THE CORNEA, with lipoma of the conjunctiva.

TUBERCULOSIS OF THE IRIS.

PARALYSIS OF THE LATERAL ASSOCIATED MOVEMENTS of the eyeball.—The patient gave a positive Wassermann reaction, and he was making rapid recovery under specific treatment.

THROMBOSIS OF THE CENTRAL RETINAL ARTERY following shell concussion.

Mr. E. Harries-Jones showed a case of

RELAPSED UVEAL TUBERCULOSIS. The man had recovered useful vision after a course of tuberculin lasting twelve months, and had remained well for some months, when, for no definite reason, the disease broke out afresh, and was almost as severe as during the first attack. He was again making fair progress under tuberculin.

Mr. Jameson Evans showed a case of

RETINITIS of undefined type in the left eye. Fine punctate yellow deposits were to be seen over the greater part of the posterior pole of the fundus, and seemed to be situated in the deep retina or superficial choroid. Vision RV $\frac{6}{6}$ LV $\frac{6}{6}$.

IMPLANTATION CYST IN THE ANTERIOR CHAMBER, following an iridectomy for glaucoma, with incarceration of the roots of the pillars of the coloboma. The cyst had been present for some years, and latterly had shrunk very much. The fundus of the cyst was adherent to the posterior surface of the cornea, but the neck seemed to be continuous with a subconjunctival cystoid cicatrix. The presence of the cyst caused little or no discomfort, and apparently had not interfered with the action of the iridectomy, but the cystoid scar, when distended, was apt to cause a little discomfort when rubbed by the eyelid.

ANGIO-SARCOMA OF THE ORBIT in a girl aged ten years, which had been treated with marked benefit by means of radium

emanations. The little tube had been inserted into the middle of the large and highly vascular growth through an incision in the lower conjunctival fornix, and was left *in situ* for twenty-two hours. Perceptible diminution in the size of the growth became apparent within a week, and it had become progressively less ever since. At the present time (a month after radiation) the growth had disappeared, with the exception of a somewhat hard nodule near the centre of the lower lid.

Mr. Wood White showed a specimen of a spindle-celled sarcoma growing from the choroid in the neighbourhood of the optic nerve.

Mr. Jameson Evans read a short note on "A Case of Glaucoma" (*vide infra*).

REPORTS OF CASES.

A CASE OF GLAUCOMA.

By J. JAMESON EVANS, F.R.C.S.

MRS. H., aged 57 years. First seen for failure of vision in left eye in February, 1915. At this time the state of her eyes was as follows :—

Right eye : Very shallow A. C. No lesion of fundus, but disc showed central cupping, which was regarded as physiological. RT + $\frac{1}{2}$. RV $\frac{2}{3}$, but varied to $\frac{6}{18}$. Field full. No complaint was made of any subjective sensations in this eye.

Left eye : Very shallow A. C. LT + $\frac{1}{2}$ LV = fingers at 2 metres. Some contraction of peripheral field (about 10° to 20°), with decided nasal step.

Ophthalmoscopically O.D. showed central cupping, much like that of the right eye. Proceeding from the cup and extending along the superior and inferior retinal vessels were striate hæmorrhages. The macular region was (œdematous) hazy, and there were a few small punctate hæmorrhages to be seen over that area.

Apart from the shallowness of the anterior chamber neither eye looked in any way abnormal, and neither the patient nor her friends had any idea that there was anything seriously the matter with the eye. In fact she did not come up for examination for some weeks after she had noticed some defect of vision in the left eye.

General Health.—She suffered from “flushes,” which were ascribed to the menopause, through which she was passing. She has mitral stenosis, with reduplicated first sound and P.S. thrill.

Blood pressure : Systolic = 180, diastolic = 100. Urine normal.

Progress.—In view of the plus tension and the very shallow anterior chamber, it was felt that something should be done to prevent the apparently inevitable onset of an acute attack of glaucoma. The presence of retinal hæmorrhages made one hesitate to perform an iridectomy, so I decided on what I felt was a less severe operative treatment, viz., the *wedge isolation* with a peripheral *iridectomy*. This was performed without any difficulty, and the immediate result appeared to me very satisfactory. Next day the eye looked very nice, the opening in the sclera seemed to be filtering, the iris was quiet, but the anterior chamber was shallow, but certainly not as shallow as before the operation. Tension was slightly +.

A day later there was some ciliary and conjunctival injection, the chamber was not so deep. Tension + 1. She also complained for the first time of seeing haloes round lights with the *right* eye. A little ciliary injection also appeared in this eye. Pilocarpin was instilled in both eyes before the operation; it was now resumed in both, but without any great improvement in the condition of the eyes. Some quiet iritis appeared, but the adhesions seemed very feeble, and the pupils dilated with cocain.

The ciliary injection persisted, and the anterior chamber became obliterated, the lens apparently having been pushed right up against the cornea. During this time the tension kept above normal, but not excessively so—somewhere about + 1, and this could be quickly reduced by massage of the eye.

Efforts were made to push the lens back, but without any success.

A *limbal puncture* was performed, and it certainly helped in the reformation of the chamber, and reduced the tension to about $+ \frac{1}{2}$. This is the condition of the eye at the present time, Schiotz tension being 26 mm. Ophthalmoscopically : the disc is atrophic ; the cupping is much the same in depth and width. All the hæmorrhages have disappeared. $LV = \frac{6}{80}$ barely.

The right eye still showed very shallow chamber ; tension variable, but always a little above normal, very distressing, and periodically she had rainbow vision, even under pilocarpin, and the question of operative interference on the right eye, in anticipation of further complications, had to be decided upon. Notwithstanding the failure with the left eye, I still thought a wedge isolation with peripheral iridectomy the most suitable form of operative treatment, and this I did on June 1st. Again the operation went off without a hitch. As there were no hæmorrhages in this eye I thought that complications such as happened in the left eye were unlikely to take place. As a matter of fact exactly the same series of troubles appeared in this (right) eye, and they came on the first day after the operation, *i.e.*, a day earlier than they did in the left. They persisted in spite of massage (which reduced the tension temporarily), and a variety of medication, including iodides, thyroid, ovarian extract, aperient powders, and calcium lactate. The latter was given on the second day after operation, because she developed a persistent congestion of the face and head, and in about a week all this area peeled as if she had had scarlet fever. The tension on an average was about $+ 1$. Haloes were persistent but the vision was good with correction. The correction, however, had changed from $\frac{+50}{+50} \theta_{30}$ to $\frac{6}{12} : \frac{-1}{-50} \phi_{75}$ (June 23).

July 28.—RV $\frac{6}{8}^{(2)} \frac{-50}{+75} \theta$ 10° RT full LnT. This after she had been given daily doses of Brunton's powders.

Pot. bicarb.	...	...	} aa gr. 10
Pot. nitrat.	...	...	
Sod. nitrit.	...	...	

August 4.—No further trouble. Eyes quiet. Wounds filtering, but A.C.'s very shallow.

Glasses ordered $\frac{R-50}{+1\theta_{10}} = \frac{6}{8}$ and $\frac{+2}{+1\theta_{10}} = J_1$.

September 23.—A.C.'s very shallow. Tn. E.E., but synechiæ posterior in both eyes. RV $\frac{6}{8}$ with glasses. I did not suspect anything going wrong, but

September 28.—RV = $\frac{6}{80}$ barely. No A.C. Corneal œdema. Misty and rainbow vision persistent for four days. T + 1 each eye. Ciliary injection.

The powders were repeated. Pilocarpin drops instilled.

October 1.—A.C.'s still very shallow. No evident corneal œdema. Coloured haloes persistent.

$$RV = \frac{6}{36} \frac{6}{12} c - 3.5.$$

October 4.—RV = $\frac{6}{12} c - 3$. RT + $\frac{1}{2}$. Some ciliary injection. A.C. apparently the same.

Remarks.—This case seems very instructive, and not a little puzzling, and I have brought it before you in some detail to get your valued opinion on it. The prominent features may be summarised thus :—

(1) Left eye :—Retinal hæmorrhages—possibly the result of blocking of the retinal vein just behind the lamina cribrosa—possibly without venous blocking.

Apart from this the case might have been looked upon as one of chronic, almost non-congestive, glaucoma, with a little tension.

The right eye was exactly in a similar condition, without the hæmorrhages.

The valvular lesion and the circulatory disturbance (flushing) were accessory features which seem to me to have been largely responsible for the complications after the operations. I am inclined to regard the original state of the eyes as one of chronic venous congestion of the ciliary processes. Why such a condition did not show any of the usual signs of cyclitis I do not know, but it is probably not inflammatory, but merely a condition of venous dilatation. After the operations external evidence of such a venous congestion appeared in the form of

ciliary injection, and synechiæ posterior and corneal œdema. It seems to me that it is possible to get distension of the ciliary veins without any external evidence, apart from a narrowing of the anterior chamber—in fact it may be the exciting cause of glaucoma of the chronic type. It would thus appear that the vascular factor is of a greater importance in the production of chronic glaucoma than we have been in the habit of thinking, and Thomson Henderson's contention seems to be borne out by this case to a more pronounced extent than I have hitherto observed.

If that is so—and the operative treatment by fistulisation seems somewhat of a failure, in this case at any rate—we should endeavour to decide on a plan of treatment which should relieve the primary cause rather than attempt to enlarge the channels of excretion, which, if anything, seem to get further obstructed by the advance of the lens and the swollen ciliary processes as their forward distension becomes easier after an opening is made in the sclera and the passage of the aqueous out of the eye is facilitated.

ABSTRACTS.

RHINOLOGICAL.

BULLET WOUNDS OF THE NOSE AND ITS ACCESSORY CAVITIES.

SIEUR & ROUVILLOIS (*Revue de Laryng.*, etc., August 15, 1915) record observations collected in Morocco.

(1) *Bullet wound of the nasal bones, with injury to the middle turbinates and nasal septum.*—The case ran an aseptic course, and as the injury did not affect the lower part of the nasal cavities, breathing through the nose was not interfered with.

(2) *Bullet wound of both superior maxillary bones, with injury to the region of both inferior turbinates.*—The wound healed without suppuration. The nasal septum showed a perforation on the left side, opposite the inferior turbinate, and on the right side an adhesion had formed between the turbinate and the septum.

(3) *Bullet wound of the right superior maxillary bone.*—A sequestrum was removed from the anterior wall of the right maxillary antrum, and healing followed without suppuration.

(4) *Bullet wound of the ascending process of the mandible on the right side, with comminuted fracture of the bone and splintering of the bones of the face and nasal cavities.*—Fragments of the bullet were removed at a later date from the right masseter muscle. The bulk of the bullet probably lay within the right mass of the ethmoid or upper part of the right maxillary antrum. Attempts were made to remove it, but without success, first by removing part of the middle turbinal with Luck's forceps and exploring the ethmoid, and then by opening the maxillary antrum through the canine fossa.

(5) *Bullet wound of the facial bones involving the nasal cavities and right maxillary antrum.*—Drainage was effected through the entrance wound and out through the left nostril. There was very little discharge.

(6) *Bullet wound of the bones of the face involving the anterior part of the palate, the nasal cavities, and both maxillary antra.*—The bullet was retained within the right maxillary antrum. A plate was adapted to cover the palatal deficiency. The anterior wall of the right maxillary antrum was fractured, and the bullet lay in the antral cavity, from which position it was removed.

From these observations the authors conclude that the passage of a bullet through the region of the turbinates and septum of the nose produces relatively slight results, from which recovery is easy. When the accessory cavities are implicated comminution of the bone is slight, and the fragments remain attached to periosteum and mucous membrane. The healing of these wounds is, as a rule, uncomplicated. The prognosis is favourable, unless there are also injuries to the larger vessels or cranium. Injuries to the upper part of the nasal cavities and the fronto-ethmoidal and sphenoidal regions rarely need surgical interference while bullet wounds of the lower nasal passages and maxillary antra more frequently require operation. Conservative surgery is advised throughout, and delay rather than haste in the removal of bullets.

WILFRID GLEGG.

NOTES AND NEWS.

UNIVERSITY OF BIRMINGHAM.

THE winter session opened on Tuesday, October 15th. The number of entries on the medical side is very satisfactory; in fact it is larger than in any previous year since the foundation of the University. This increase is confined to students of medicine, and there is a very marked falling off in the entries for the dental course.

Dr. T. Yeates has been appointed Lecturer in Anatomy to the Middlesex Hospital, London. His loss to the University will be felt by the many friends he has made amongst students and colleagues during his long service as Lecturer and Demonstrator in Anatomy to the Faculty of Medicine.

The following appointments have been made in the staff :—
 Dr. Olive Elgood Turner has been appointed Demonstrator in Anatomy to the women students, and Dr. Mary Clarke Lecturer in Hygiene to the students of the Training College for Women. Mr. Bertram Lloyd, F.R.C.S., has been appointed Demonstrator in Anatomy for the session 1915-16, and Miss Hilda Walker will give tutorial instruction in physiology during the absence in Serbia of Dr. Gwynne Maitland.

THE UNIVERSITY AND THE WAR.

THE following table shows the number of officials, servants, students, and past students serving with the Colours :—

Members of teaching staff (professors and teachers)	...	...	...	...	58
General staff ...	...	...	...	...	41
Present students	...	...	...	...	228
Past students	...	...	...	...	194
Total ...					521

The University casualty list has so far been fairly light, the total now being 40, including two killed and one (Professor Chatelain) death. The figures are as follows :—

	Killed.	Wounded.	Died.	Missing and Prisoners.
Teaching staff ...	0	2	1	0
General staff ...	0	0	0	0
Present students ...	10	5	0	1
Past students ...	11	10	0	1

The distinctions gained include a Military Cross awarded to the late Captain J. T. S. Weston, 1st Battalion Royal Berkshire Regiment, for conspicuous service in France. Captain Weston was a medical student at the University at the outbreak of war. The Military Cross has also been conferred on Lieut. A. C. Hincks, 26th Field Ambulance, R.A.M.C. (a former medical student), for conspicuous gallantry at Neuve Chapelle.

We regret to record that amongst those killed in action is included Second Lieutenant Raymond Lodge, the youngest son of Sir Oliver and Lady Lodge. He was twenty-six years of age, and was attached to the South Lancashire Regiment, joining just after the outbreak of war. He went through a course of engineering at the University, and was popular among the staff and undergraduates. Latterly he had been associated with the firm of Lodge Bros., electrical automobile engineers, Wrentham Street.

EXAMINATION PASS LISTS.

THE following list of successful candidates was issued on October 7th, 1915 :—

(1) *Fourth Examination for the Degrees of M.B., Ch.B. (Therapeutics).*—E. E. R. Spurway.

(2) *Second Examination for the Degrees of M.B. Ch.B. (Anatomy and Physiology).*—Gladys Mary Cooksey, A. F. M. Fuoss, and A. Sudki.

(3) *First Examination for the Degrees of M.B. Ch.B. (Physics, Chemistry, and Biology).*—Internal candidates : Class II., G. C. Thornton. Completed the examination : C. C. Bradsworth, Agnes Annie Sloan Robertson, A. Sudki, and F. S. Vaughan. Passed in part of the examination : E. F. Brown (chemistry and biology). External candidates : Class II., P. G. Allday, King Edward's High School, Birmingham ; P. B. Bayliss, King Edward's High School, Birmingham ; A. S. Pearson, West Bromwich Municipal Secondary School. Completed the examination : Katherine Frances Brierley Houghton, Girton College, Cambridge.

ROYAL ARMY MEDICAL CORPS.

THE following announcements have recently appeared in the *London Gazette* :—

S. Midland Mounted Brigade Field Ambulance.—Lieut. A. Leggat, M.B., to be captain (April 1).

S. Midland Mounted Brigade Field Ambulance.—Lieut. D. Buchanan to be captain (September 25).

N. Midland Field Ambulance.—The undermentioned lieutenants to be captains :—J. C. Grieve, M.B. (April 1) ; R. B. Berry, M.B. (April 19) ; F. G. Bennett (April 20) ; C. B. Johnstone, M.B. (May 18) ; L. T. Challenor (April 1) ; R. B. M. Yates, M.B. (April 1) ; B. S. Wills, F.R.C.S. (April 24) ; T. Graham, M.B. (April 26) ; S. R. Foster, M.B. (May 27) ; W. Boyd, M.D., F.R.C.S. (Edin.) (April 1) ; J. C. Harris (April 1) ; G. F. Haycraft (April 1) ; S. S. B. Harrison (April 17) ; W. B. Williams, M.B. (July 23).

S. Midland Field Ambulance.—Major F. J. Warwick, M.B., from East Anglian Casualty Clearing Station, to be major (September 25) ; Captain D. Buchanan, from S. Midland Mounted Brigade Field Ambulance, to be captain (Sept. 25).

N. Midland Casualty Clearing Station.—Lieut. W. T. Wood to be captain (April 19).

N. Midland Mounted Brigade Field Ambulance.—Lieut. A. W. McClelland, M.D., to be captain (June 23).

S. Midland Field Ambulance.—G. Moore, M.B., late lieutenant, Princess Charlotte of Wales's (R. Berks. Regiment), to be captain (September 7).

N. Midland Field Ambulance.—Lieut. J. W. Thomson, M.B., to be captain (April 23); Lieut. P. Sturm, M.B., to be captain (September 15).

S. Midland Field Ambulance.—G. H. Hart (late captain 1st V.B. R. War. Regt.) to be captain (temporary) (Sept. 20).

S. Midland Mounted Brigade Field Ambulance.—S. P. Johnson, M.B. (late surgeon-lieutenant 1st War. R.G.A. (Vols.)), to be lieutenant (October 2).

N. Midland Mounted Brigade Field Ambulance.—J. M. Mitchell, M.B., to be lieutenant (September 14).

S. Midland Mounted Brigade Field Ambulance.—Lieut.-Col. A. G. Hendley, retired list, Indian Medical Service, to be captain, temporary (August 11).

N. Midland Mounted Brigade Field Ambulance.—Major A. C. Goodwin, M.B., F.R.C.S., to be temporary lieutenant-colonel (September 24); Capt. T. G. Buchanan, M.B., to be temporary major (September 24).

T. B. Rhodes, M.B., to be temporary major whilst employed with the N. Staff. Yeomanry (September 10).

S. Midland Mounted Brigade Field Ambulance.—The undermentioned lieutenants to be captains:—W. T. Torrance (April 1); R. W. Aitken, M.B. (April 1); C. R. Wallace (April 1); A. Mitchell, M.B. (April 3). The undermentioned lieutenants to be captains:—H. F. Humphreys, M.B. (April 1); G. A. Auden, M.D. (April 1); W. E. H. Bull (April 15).

ANNUAL REPORT OF THE ORTHOPÆDIC HOSPITAL.

THE annual report of the Birmingham Royal Orthopædic and Spinal Hospital, to be presented at the meeting of Gover-

nors on the 28th October, records another year of useful and successful work. The accounts show an excess of expenditure over income amounting to £800 19s. 8d., and the slender reserve resources of the institution are therefore again further depleted. The utmost care has been taken to see that the hospital is worked with all possible economy, and in this direction the committee express special thanks to their lady colleagues for their valuable help with regard to the supplies for maintenance. The resolution passed at the last annual general meeting requiring twelve tickets for in-patients has had a good result without interfering with the general efficiency of the hospital; but the stay of some of the patients is of necessity a long one, and over 1,200 tickets would be required to clear off the total indebtedness of all the patients resident during the year. Indeed, it may be said that one-third of the beds have been entirely free and without tickets. During this period forty patients were in the hospital for more than 50 days each, six being in for more than 100 days, and one for so long a term as 205 days.

The statistics show a falling off in the numbers of patients, etc., but the hospital has been fully occupied for practically the whole year. The number of patients treated was 2,202. The in-patients numbered 278, operations 504, country patients 732, and out-patient attendances 12,534. Twenty-five cases were treated and minor operations performed to enable men to enlist, and four soldiers and five Belgian refugees have been admitted. The committee feel that with more adequate means at their disposal, and with a suitable and modern building for in-patients, there is still ample room for a considerable extension in the work of the hospital, and they trust the time is not far distant when the opportunity may arrive for a realisation of the hopes they entertain of making more strenuous effort to relieve the large number of cases which are at present almost untouched.

Deformities from War Injuries.

The Medical Committee, in their report, state that all three honorary surgeons and one clinical assistant are engaged on war service, and that the late massage sister left to act as assistant

matron at Highbury, while her successor has also left to take up military work. This has naturally thrown a considerable strain on the matron, and, indeed, on the whole of the nursing staff, and the Committee express their thanks to them for the helpful way in which they have combined to carry on the work of the hospital. At a time like the present it would be profitable to urge the crying need for the rebuilding of the hospital. It only need be stated that the demands of the suffering public on the help of the institution remain as heavy as ever, and that all those familiar with relief work among the poor agree that the demand for our notes is constant. These conditions can only be obviated by a greatly increased subscription list, and subscribers and friends are urged to remember how much physical disability in adult life is prevented by the early help of the institution. In addition the Committee ask subscribers to bear in mind the deformities resulting from injuries received during the war must in future, to a very great extent, be referred to this institution in the last resort. They would like to be prepared to deal with these cases, as theirs is the only hospital in the Midlands which is purely devoted to the treatment of deformities.

BIRMINGHAM HOSPITAL SATURDAY FUND.

THE Board of Delegates of the Birmingham Hospital Saturday Fund recommends that from this year's collection £10,000 be presented to the medical institutions of the city on account of the relief and maintenance of patients. The distribution of the money will be made in the following manner :—

General Hospital	...	...	...	...	£3,150
Queen's Hospital	...	...	...	...	2,100
General Dispensary (general fund £510, relief					
fund £500)	...	...	...	...	1,010
Children's Hospital	...	...	...	...	800
Birmingham and Midland Eye Hospital	...				350
Birmingham & Midland Counties Sanatorium					100
Homœopathic Hospital	...	...	...	...	200
Women's Hospital	...	...		...	500

Lying-in Charity	...	...	...	...	£200
Orthopædic Hospital	...	...	...	...	300
Ear and Throat Hospital	...	...	...	...	125
Dental Hospital	...	...	...	...	50
Skin and Urinary Hospital	...	...	...	...	200
District Nursing Society	...	...	...	...	150
Jaffray Suburban Branch Hospital	...	...	...	...	400
Moseley Hall Convalescent Home for Children					200
Aston Manor District Nursing Association	...				25
Smethwick District Nursing Institution	...				25
Birmingham and Midland Hospital for Nervous Diseases	...	...	...	...	25

£10 each to King's Heath District Nursing Society, Sparkhill and Greet District Nursing Society, Sutton Coldfield Home of Rest for Women, Acock's Green, Hay Mills, and South Yardley District Nursing Society, Selly Oak and Bournbrook Nursing Society, Erdington District Nursing Society, Handsworth District Nursing Society, King's Norton District Nursing Association, and Harborne District Nursing Society; and £5 to Selly Hill, Dog Pool, and Ten Acre District Nursing Society.

THE annual dinner of the Birmingham and District Edinburgh Graduates' Club has again been abandoned, owing to the war.

BOOK REVIEWS.

An Index of Symptoms with Diagnostic Methods. By RALPH WINNINGTON LEFTWICH, M.D. Fifth edition. London : Smith, Elder & Co. ; 1915. Price 10s. 6d. net.

THE present edition of this extremely useful work appears in a considerably enlarged form, so that it can no longer be regarded as a pocket book. The increase in bulk has resulted from the inclusion of a large amount of fresh matter including new symptoms, new tests and the amplification of the interlineary notes. The classification of symptoms has been arranged on a scientific basis which should prove of much help to the student in the elucidation of cases and to the teacher in the exposition and classification of his clinical material. Diagnosis is the surest test of a clinician's knowledge and acumen, and this work, more than any we know of, is calculated to increase the practitioner's diagnostic powers, and will often help him out of difficulties. As a book of reference it will probably be more frequently used than any on the doctor's bookshelf, and that with much advantage to his own good name and his patient's well-being. We feel sure that the work will continue to retain that general appreciation which it so richly deserves.

Materia Medica and Pharmacy for Medical Students. By REGINALD R. BENNETT, B.Sc., F.I.C. Third edition. Price 4s. 6d. net. London : H. K. Lewis & Co. 1915.

THE issue of a third edition of this little work within seven years shows that it meets with a real demand among students of medicine. The use of brief notes seems justifiable in materia medica and pharmacy, as a real knowledge of the subject can only be acquired by practical acquaintance with the drugs and

their preparation for medicinal use. The volume before us gives a concise account, lucidly arranged, of the drugs, chemicals and compound preparations of the British Pharmacopœia. The pharmacological classification adopted in former editions has been retained, but it has been fully revised so as to conform with the provisions of the British Pharmacopœia of 1914, as regards the introduction of new remedies, the discarding of old preparations, and the use of the metric systems, etc. The doses have also been expressed in terms of the Imperial system, so that there need be no misunderstanding on this important point. An appendix contains a chapter on incompatibilities and a selection of Latin words and phrases which will be found useful.

The work contains all the information on *materia medica* and pharmacy which a student is likely to require and we can recommend it as a reliable guide on the subject.

“The British Journal of Surgery.” Vol. III, No. 9. Bristol : John Wright & Sons, Ltd. (Issued quarterly.) Single numbers 7s. 6d. net ; one year’s subscription 25s. net.

WITH the publication of the present number “The British Journal of Surgery” enters upon its third year. The publication of any new journal is always a cause for some anxiety to the promoters during the first months of its existence. It is a pleasure to know, therefore, that the hopes of the publisher of “The British Journal of Surgery” have been abundantly realised during the few years that the periodical has been before the medical profession. Nor is this a matter for surprise. There was without doubt a very real place for a journal expressing the current view and work of British surgeons. The need was felt both at home and abroad ; at home, because it prevented the rigid isolation of the individual surgeon within a hospital community from his co-workers ; and abroad, because it afforded the opportunity of laying the advances in British surgery before the whole world.

Under the able editorship of Sir Berkeley Moynihan and his committee of well-known British surgeons, the journal has

already reached the highest position in the scientific quarterly periodicals of the day. This enviable position has been obtained by scrupulous care in employing only the best, both in matter, illustration, and printing.

The present number more than reaches the high standard set by its predecessors. The illustrations in themselves are a prominent feature, the coloured drawings being particularly good.

Amongst literary communications an article on the Character, Significance, and Prognostic Value of Peritoneal Exudates, by Mr. Robert Carslaw, is deserving of special mention. The paper is the result of an investigation into the necessity for drainage of the peritoneum in cases of diffuse peritonitis. The author concludes that local drainage is very often necessary, but that drainage of the general peritoneal cavity is not only unnecessary, but also injudicious. It is called for only in very exceptional cases.

G. E. Armstrong contributes a note on results of operation for malignant tumour of the breast, based upon 102 cases of mammary tumour. Of 82 cases, 65 have been traced, and of these 33 or 50 per cent. are well three years after operation.

Eric Pearce Gould describes three interesting mesenteric tumours, and a case of retroperitoneal hernia cured by operation is placed on record by Rendle Short.

A detailed and interesting clinical study of actinomycosis, with illustrative cases and coloured drawings, is contributed by Zachary Cope, whilst unilateral hæmorrhage and unilateral pain of renal origin is discussed by Cuthbert Wallace and Leonard S. Dudgeon.

War surgery naturally claims considerable space, and one section of the current journal is reserved for the report of interesting cases from the base hospitals and casualty clearing stations now established with the expeditionary forces. The military consorship exercised over all literary matter from the front causes slight delay in publication, but the interest of the reports received more than compensates for the slight inconvenience. Several of the reports are exceedingly well illustrated,

a point which speaks highly for the artistic ability of the men now employed at the hospitals in France.

War surgery also forms part of a very interesting article contributed by Professor Tuffner of Paris, upon current French surgery. The inclusion in this number of a critical review of current work by one of our surgical confrères from abroad is a novel feature, and one deserving of very favourable comment. Professor Tuffner's contribution in the current volume is full of interest.

Sufficient has been said to indicate the general scope of the journal, and we take this opportunity of congratulating the Editor and publishers upon producing a scientific periodical of first-rate importance, which admirably fulfils the purposes for which it was promoted.

X-Rays : How to Produce and Interpret them. By HAROLD MOWAT, M.D. (Edin.). Oxford Medical Publications. 8s. 6d. net.

IN the first half of this volume of 200 pages the author has very successfully compressed the essentials of the technique required to produce X-rays. In the second half he offers many useful observations on the appearances presented on the screen and photographic plate by various medical and surgical conditions. The subject of therapeutics is not considered.

The book is likely to prove of most service to medical men who have no knowledge of X-rays work, and who are suddenly called upon to manipulate an X-rays outfit for civil or military practice.

Under the heading of Cancer of the Stomach we read that "in all cases it is advisable for the radiographer to have a full report of the clinical signs and symptoms before him before he makes a definite diagnosis." It is the strong conviction of the reviewer that this practice should be followed in all branches of X-rays diagnosis, since fewer mistakes would be made and the radiographer himself would benefit by an enlargement of his clinical experience.

Squint : Its Causes, Pathology, and Treatment. By CLAUD WORTH, F.R.C.S. Fourth Edition. Price 6s. net. London : John Bale, Sons and Danielsson, Ltd. 1915.

SQUINT continues to be a matter of keen interest to the medical profession, and Worth's treatise holds its place as the most concise exposition on the subject in the English language. Its appreciation is, however, not confined to the English-speaking races, as the work has been translated into German.

Parinaud's definition of squint as a " vice in the development of the binocular vision apparatus " is sufficiently wide to allow of its acceptance by surgeons who hold varied views as to the immediate cause of that vice.

We think it would have been well to leave the matter at that for the present, since we feel with Landolt that we must acknowledge that many cases of squint are still beyond our comprehension.

The author of this treatise, however, is convinced that the *essential* cause of squint is a defect in the fusion faculty, and to the training of this faculty all his efforts are directed. The methods of treatment are based on the lines laid down by Javal, Parinaud, Priestley Smith, and others, and the means employed show that the author is possessed of a vast amount of patience and much ingenuity in overcoming difficulties in dealing with young children. His successes bespeak also a rare tact in dealing with parents and others, whose aid must be sought in carrying out the exercises during the intervals between the visits to the surgeon. Even Javal, in his first case (a near relative) came close to an open rupture with the parents of the child, owing to his persistence in the fusion exercises, and most of us have, perforce, to give up the struggle before we reach such a point with ordinary patients. When we do find enthusiastic and persevering patient and parents, and success seems within our grasp, it is not uncommon to find that the fusion faculty is so feebly established that it is lost again when the exercises are discontinued. The question then naturally arises, " Is it worth while " unless fusion is quickly established? We think it must

be recognised that some squinters are possessed of a fusion-faculty, and that some people who do not squint have no fusion-faculty, and it is in the former class of squinters that we can hope for success by the methods detailed in this book. The work is, however, not entirely concerned with fusion training, and the chapters dealing with the methods of investigation of squint and heterophoria are excellently written, and form an admirable *resumé* of modern diagnostic procedures.

In the chapter on operations on the external ocular muscles the author describes his own method of advancement of the rectus, a procedure he has now entirely adopted, to the exclusion of tenotomy, whether simple or combined with advancement, thus falling in with the views of Landolt and others, who have given the subject very close and prolonged attention.

The work, therefore, constitutes an admirable guide to the treatment of squint both by the educative and operative methods, and remains the standard work on "Squint" in this country.

Human Physiology. By PROFESSOR LUIGI LUCIANI. Translated by FRANCES A. WELBY, with a preface by J. N. LANGLEY, F.R.S. In Five Volumes. Vol. III. Edited by GORDON M. HOLMES, M.D. Price 18s. net. London: Macmillan & Co., Ltd. 1915.

THE third volume of Professor Luciani's classical treatise deals only with the muscular and nervous systems, but the importance of the subjects demands that their discussion should not be curtailed on the score of limited space. The author has done full justice to each subject. The muscular system is naturally treated in the exhaustive and thoroughly scientific way which has characterised the work of the Italian school in this particular branch of practical and experimental physiology. This section constitutes a masterly exposition of a difficult subject, and should be read by all who are interested in the question of fatigue, which has now become almost a popular topic in our national life, but which needs still further elucidation by

experimental and practical study. Chapter III. of this section, which deals with Phonation and Articulation, is practical and instructive, and not over-elaborated.

The nervous system very properly follows on the section devoted to the muscular system. This section occupies 460 pages, and forms a most comprehensive and exhaustive treatise on the physiology of the nervous system. Minute details are given of the histological and experimental basis of nervous physiology, but the author never loses sight of the importance of the application of these physiological principles in clinical practice, and the work teems with information which the neurologist will find essential in his daily work. We know of no treatise which is better suited to the requirements of students of neurology and psychology, and to the practising physician it will serve as a sound basis for his clinical studies of nervous lesions and mental diseases.

The work has been admirably translated, and the book is attractively published. The illustrations are numerous and well executed. In every respect this volume well maintains the high standard of excellence of its predecessors, and we predict that it will meet with the approbation and appreciation of English-speaking physiologists and medical practitioners throughout the world.

Urgent Symptoms in Medical Practice. By ROBERT SAUNDBY, M.D., LL.D., M.Sc., F.R.C.P. v. + 426 pages. London : Edward Arnold. 1915. Price 7s. 6d. net.

In his preface, the author states that "this book is intended to be a handy work of reference for the busy practitioner or student who desires to learn quickly, without the delay and labour of consulting several volumes, the significance of a particular symptom, the indication it affords, and the means whereby it may be relieved, due regard being had to the importance of attacking the true cause, and not merely the superficial phenomena of disease." There is no evidence that Professor Saundby has made any effort to restrict himself to the

discussion of symptoms which are urgent or acute, and he even deals with subjects which can hardly be called medical, such as hydrocele, scoliosis, spondylolisthesis, varicocele, etc. The treatise constitutes a miniature dictionary of medicine, and as such it will prove a useful addition to the library of the student and practitioner. It is also just the sort of work on medicine which is particularly adapted for the use of nurses, who will find concise and clear accounts of every medical condition they may be called upon to deal with.

In a work of this type it is inevitable that the articles should be treated somewhat unequally. Those subjects in which the author has had extensive experience are excellent, whilst those with which he is evidently less familiar are more cursorily dealt with. The book contains a vast amount of useful information in a small compass, and should prove very serviceable to students, nurses, and practitioners.

An Index of Treatment by various Writers. Edited by ROBERT HUTCHISON, M.D., F.R.C.P., and JAMES SHERREN, F.R.C.S. Seventh Edition. Price 21s. net. Bristol: John Wright & Sons, Ltd. 1915.

THE imposing list of distinguished contributors, and the fact that this work has reached its seventh edition in as many years, almost disarm criticism of this well-established work, and it is only necessary to draw the attention of our readers to some of the new features in the present edition. The surgical editorship has now been undertaken by Mr. Sherren, who has carried out his new duties with eminent success. Among fresh articles included are those on Sterility, Radium-therapy, and Psycho-neuroses, all subjects deserving inclusion, and worthy of the attention of the profession. The articles are remarkably uniform considering the multiplicity of contributors, and each subject is treated with commendable brevity without, however, any sacrifice of lucidity. There has been careful revision throughout, and every article has been brought thoroughly up-to-date. In many cases it has been necessary to have the

articles rewritten by new writers, in consequence of the death of the former contributors, which, we regret to find, number ten of the leading members of our profession.

We have nothing but praise for the way the work has been carried out by the contributors—old and new, and the publisher's work, as usual, has been executed in good taste, and the paper, printing, and illustrations are excellent.

BOOKS RECEIVED.

From Longmans, Green & Co., London—

Principles of General Physiology. By W. MADDOCK
BAYLISS. Price 21s. net.

From Cornish Brothers, Ltd., Birmingham—

Studies in Anatomy from the Anatomical Department of
the University of Birmingham. Published by the
Council of the University, and edited by PROFESSOR
PETER THOMPSON. Price 10s. net.

From Baillière, Tindall & Cox, London—

Life : A Poem. By BASIL GORDON MORISON, M.D. Price
3s. 6d. net.

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CARCINOMA OF THE STOMACH.

By JAMES SHERREN, F.R.C.S., *Surgeon to the London
Hôpital, etc.*

WHEN I received the invitation of the Council to give the address at the inaugural meeting of the Midland Medical Society and saw the names of the distinguished members of the profession who had previously addressed you I was deeply conscious of the honour you had conferred upon me, but appreciated the difficulty of worthily following those who had stood here in other years.

The choice of a subject was difficult also. I felt that while the energies of all surgeons at the present time were directed to discovering the most efficient means of repairing the injuries of war and returning the wounded again efficient in the shortest possible time, my personal experience in the treatment of war wounds in general or of those of any particular region had not yet yielded ideas definite enough to form the substance of an address of this nature.

I also realised that it would be a relief to turn aside even for a brief space from the surgery due to the present abnormal state, and direct our attention to the normal struggle in which we are constantly engaged in our efforts to prevent, and when present to eradicate, malignant disease.

I have purposely left the title of my address wide—Carcinoma of the Stomach—as I wish to touch upon various aspects of the disease this evening.

No one is more conscious than myself of the pioneer work on abdominal diseases and digestive disorders that has emanated from the Midland counties of England. It should be impossible for any English speaking surgeon to forget the debt we owe to Lawson Tait, Jordan Lloyd, Gilbert Barling, Mayo-Robson, Moynihan, to mention but a few who have contributed to the development of abdominal surgery.

It is not my intention, however, to review the development of the surgery of this organ, but to attempt to put before you opinions formed from a personal experience of 159 cases in which the diagnosis was confirmed at operation or at the subsequent examination of the specimen removed thereat.

There is no internal organ in which the possibility of the prevention of malignant disease is so great or of operative cure so good; but—one is bound to add—in which the difficulty of early diagnosis is greater.

I am strongly of the opinion that carcinoma of the stomach may in many cases be prevented. The following is a recent example of my meaning. Four weeks ago I operated upon a woman of 34 who for nine years had suffered from what was rightly diagnosed as chronic gastric ulcer. She had been treated on many occasions by prolonged rest in bed, diet and drugs, only to relapse within a short period of resumption of normal life. She had been under treatment in a provincial hospital for three months before she was sent to me.

I performed partial gastrectomy for advanced malignant disease, starting on the lesser curvature near the pylorus, and the patient returned to her home in Devonshire three weeks later.

The specimen was examined in the London Hospital Pathological Laboratory. The carcinoma was found to be starting from both cardiac and pyloric edges of a chronic gastric ulcer, and to have invaded the coronary, subpyloric, and the right gastro-epiploic glands.

Had surgical treatment been adopted after the first clear failure of medical means of relief I have no doubt that the onset of malignant disease would have been prevented.

I have on several occasions drawn attention to this question of the prevention of carcinoma of the stomach. In an address delivered before the South Essex Division of the British Medical Association four years ago I stated :—¹

“ There is little doubt that acute gastric and duodenal ulceration is a septic disease. Acute ulcers of the stomach and duodenum are frequently found *post-mortem* in cases of appendicitis, urinary sepsis, burns, etc. Cell poisons circulating in the blood lower the resistance of the gastric cells, so that auto-digestion takes place, or minute suppurative foci occur in the lymphatic follicles along the lesser curvature. Oral sepsis is, I believe, a fertile cause of gastric ulcer, and hence one of the predisposing causes of cancer of the stomach. It is no uncommon thing for me to have to delay operation on patients with undoubted organic gastric disease of long standing until carious stumps have been removed. . . .

“ Every acute ulcer, whether of the type found in the disease called gastrostaxis or not, should be treated by rest in bed and suitable medical measures after all carious teeth have been dealt with.

“ Chronic gastric ulcer should be treated in the same way unless signs of pyloric stenosis or hour glass stomach are present, or hæmatemesis occur, when the surgeon should be called in. If rest fails to relieve or symptoms recur on resuming work surgical treatment should be adopted.

“ Attention to hygiene of the mouth, thorough treatment of acute and early chronic gastric ulcer, handing over to the surgeon those in the latter group that fail to respond to or relapse after treatment would, I am sure, greatly diminish the incidence of carcinoma of the stomach.”

My further experience fully bears this out. I believe that the early surgical treatment of chronic gastric ulcer (after the failure of thorough medical means) will prevent the later onset of malignant disease. I have found as a result of watching the cases over a period of years and of examination of the seat of the ulcer at subsequent operations for other causes, or *post-*

¹ *British Medical Journal*, June 24, 1911.

mortem, that a simple chronic gastric ulcer, in whatever part of the stomach it may be situated, will heal as the result of gastro-jejunostomy correctly performed unless the ulcer is adherent and has perforated, its floor being formed by pancreas or liver, thus preventing the contraction necessary to sound healing.

One hundred and sixteen of my cases of unperforated chronic gastric ulcer treated by gastro-jejunostomy without excision have now been operated upon between two and twelve years. There was one death from broncho-pneumonia. I have been able to ascertain the later history of 104. In no case has malignant disease developed. This is not in accordance with the views of many surgeons, but I have made it a rule to treat by excision in addition to gastro-jejunostomy all suspicious ulcers.

The proportion of these has been as follows. Out of 226 cases of chronic unperforated gastric ulcer operated upon, in 49 partial gastrectomy or excision of the ulcer, combined with gastro-jejunostomy was carried out. I would, however, point out that although serial sections were cut, carcinoma was discovered in six only.

Cases of carcinoma of the stomach may be divided by their symptoms into three groups.

- (1) In which it supervenes on previous gastric disease ;
- (2) In which it originates in patients with a previously clean gastric history ;
- (3) In which attention is drawn to the condition by the presence or effects of secondary deposits.

Those in the third group are few in number. In these attention is drawn to the disease by such symptoms as ascites, enlargement of the liver, pelvic tumour or thrombosis of veins.

The first two groups correspond fairly well with the two groups into which it is convenient to divide surgical digestive disorders in general,—

- (1) In which “attacks.” are separated by intervals of perfect digestive health ;
- (2) In which complaint is made of more or less continuous discomfort.

The first group is unfortunately the smaller, comprising about one-third of the cases. It is difficult, at any rate in this country, to obtain positive *pathological* evidence that the carcinoma of the stomach removed at operation originated in a chronic gastric ulcer. By the time most come under the care of the surgeon the malignant disease is so extensive that it is impossible to discover evidence of its origin. Only in three out of 33 operated upon with the diagnosis of malignant disease established was it possible to demonstrate that the carcinoma started at the edge of a chronic ulcer. On the other hand, in 49 cases operated upon with a typical history of chronic gastric ulcer in which excision was carried out on account of the induration or suspicious nature of the ulcer, carcinoma was discovered in six.

From the clinical side the evidence is, I think, definite. Fifty-six out of the 159 cases gave a history extending over four years, which would have been sufficient at any time to justify the diagnosis of organic gastric disease.

Continuance of symptoms and failure to relieve by rest in bed, diet and drugs, are suggestive of the onset of malignancy.

Similar symptoms are, however, produced by the development of hour-glass stomach, a condition often diagnosed as malignant disease supervening on ulcer. I shall have to refer more fully to this later.

The presence of the hour-glass contracture may be demonstrated by X-ray examination after a bismuth meal, but the ulcer producing the contracture may have developed malignancy.

Examination of the gastric contents after a test meal usually shows that free HCl and total acidity are little removed from normal, unless pyloric obstruction or hour-glass stomach has supervened.

I have the records of test meals in 20 cases of this group, in which there was a gastric history of over four years' duration. Free HCl was present in about normal amount or a little raised in 14. Of the remainder, in two there was marked dilatation, in three hour-glass stomach.

As I have previously pointed out, it is usual to get a low acidity, and commonly absence of free HCl in cases of simple hour-glass stomach.

On the other hand, in 50 cases of under two years' duration, in five only was free HCl present, it was markedly diminished in three, and in two patients so high ('17 94, '16 74) that in both duodenal ulcer had been diagnosed, and the patients treated for this condition for 15 and 11 months before coming under my care. In both the malignant disease was at the pyloric end of the stomach, and inoperable. One of these was a particularly sad case, of a medical man, who, thinking the condition duodenal ulcer, had postponed operation until a more convenient season !

Malignant disease supervening on chronic duodenal ulcer must be of extreme rarity. In an operative experience of 261 cases of unperforated chronic duodenal ulcer I have not yet met with it. On the other hand, in two cases of chronic duodenal ulcer a note was made at the time of the original operation that the ulcer had spread to the stomach ; in both malignant disease of the stomach supervened, and the patients again came under observation on account of the " recurrence " of symptoms about eighteen months later. I was able to perform partial gastrectomy in one, and the sections showed the growth starting in the edge of the chronic gastric ulcer ; in both the duodenal ulcer had completely healed.

Although in this, as in the other groups, all the signs that make for a positive diagnosis are late signs, the outlook is good, for, with modern surgical treatment, it is possible to prevent the onset of malignancy. Even when malignancy has developed the prognosis with regard to operability and length of survival is better than in the next.

Despite much recent work on the chemistry of the stomach and investigation by gastroscope and by X-ray examination after opaque meals, the early diagnosis of the cases in the second group is still one of the dark chapters of medicine.

If it can be made with certainty the disease is no longer early. The early diagnosis of carcinoma of the stomach is impossible apart from exploration.

My friend, Dr. Hale White, has said :—

“If symptoms of serious chronic indigestion first appear after the age of 40, organic disease of the stomach should be strongly suspected, and if a comparatively short period of medical treatment does not effect a cure it may be quite justifiable to open the abdomen.”

Coming from a physician, these are weighty words, and the problem is put almost as forcibly as if it had come from the surgeon.

If this were acted upon the cases seen by the surgeon would be earlier, and the outlook brighter than at the present time.

The insidious onset of gastric disturbance in an adult should always be looked upon with suspicion, and thoroughly investigated, not forgetting the possibility of it being due to urinary disease. Among cases sent to me as carcinoma of the stomach were two cases of enlarged prostate, in which the symptoms entirely disappeared after removal, and have remained absent after a lapse of nearly two years.

From time to time cases of tabes with gastric crises are sent to the surgeon for “gastro-jejunostomy.” The nature of the symptoms should not suggest the possibility of carcinoma of the stomach, and the routine general examination that is necessary in every case of suspected abdominal disease would at once suggest the cause of the attacks of pain and vomiting.

Although every surgeon who is interested in abdominal disorders has come across cases in which gastro-jejunostomy has been carried out for gastric symptoms, due to nervous disease, the number is negligible compared with those who, labelled as nervous or neurotic dyspepsia, have endured years of needless suffering, and often lost their lives directly to this. Among the simple cases in men duodenal ulcer is often still so-called, in women gall stones. Of more serious import, however, are the malignant cases. Three stand out

vividly in my memory. An American who landed in England on a journey sent to seek health with this diagnosis. I had to operate on him for a perforated malignant ulcer of the stomach; a woman of 35, to whom I was called at the Nursing Home, where she was undergoing a rest cure for this condition; and an elderly gentleman, who had been treated under this diagnosis until the disease had become inoperable.

If symptoms are not relieved by thorough medical treatment or relapse occurs no delay should be countenanced, but surgical intervention carried out. I am not advocating reckless abdominal exploration. Opening the abdomen to establish a diagnosis before every other means has been exhausted is unjustifiable. If on operating some organic surgical condition is not revealed it usually means that the previous examination has not been sufficient.

In this, the second group of case, the symptoms suggest in their early stages dyspepsia, the result of extra-gastric disease, such as chronic appendicitis or gall stones, both conditions in which an absence of free HCl and low total acidity is common.

Occasionally the first symptom in the group is a profuse hæmatemesis, or the presence of an abdominal tumour. Both are rare. The first patient with the former came under my care five years ago,² and I have recently had a second.

In three patients the first symptom noticed was an abdominal tumour. This was *followed* by digestive disturbance.

Many patients suffering from chronic appendicitis are sent for operation on the diagnosis of malignant disease, a diagnosis often difficult to refute apart from operation.

The following are examples. In January, 1911, a male, aged 43, was sent for operation as carcinoma of stomach. He gave a history of long continued fulness after food. In the preceding twelve months this had been worse, with irregular pain and vomiting. His test meal showed an absence of free HCl, total acidity 35. At operation I found stomach, duodenum, and gall bladder healthy. I removed a small fibrotic appendix. He lost his indigestion, and remains well.

² *Clinical Journal*, Oct. 19, 1910.

In this case I made a note before operation that the diagnosis of carcinoma was probably incorrect, because of the low gastric acidity associated with a long history, and that the symptoms were more likely to be secondary to chronic appendicitis.

The following case also illustrates the help that may be given by the result of a test meal.

R. T., aged 45, was brought to see me in May, 1913, by his medical man, who was suspicious of carcinoma. He first came under observation four weeks previously, having had vague discomfort in the epigastrium, with flatulence and loss of weight. He had been thoroughly treated, including rest in bed, without relief.

The result of the test meal showed free HCl ·16, total acidity 78. This, while making the diagnosis of carcinoma of stomach very improbable, did not entirely exclude it, as in pyloric growths hyperacidity may be present. A motor meal, however, gave no evidence of delay in emptying the stomach. The result of the bismuth meal was confirmatory. The report was as follows :—

“ The lower border of the stomach is divided at about its middle into two parts, the upper portion being funnel-shaped, and the larger. Vigorous contractions of the lower half were noted. The bismuth passes rapidly through the duodenum into the small intestines. No duodenal spasm.

“ The condition is due to an hour-glass constriction with spasm, probably due to gastric ulcer.”

This certainly excluded the possibility of pyloric carcinoma, and as the X-ray diagnosis of ulcer was not in conformity with the history, the probability of appendix-dyspepsia was very great.

At operation the stomach and duodenum were normal. The appendix ran upwards and inwards, and was very adherent. It was sharply bent on itself at its centre, its terminal part being dilated. He has remained well.

In both these cases, although the history, particularly in the latter, was suggestive of malignant disease, further clinical examination did not confirm it. In face of the severity of the symptoms operation held out the best chance of relief.

Although patients suffering from cholelithiasis are sent to the surgeon from time to time as carcinoma of the stomach,³ a careful consideration of the history is usually sufficient to negative this diagnosis.

In considering the diagnosis I lay the greatest stress upon a careful history, followed by an equally careful physical examination.

A test meal is often a great help. In cases with a long gastric history there is usually no diminution of acidity. In those in which the history is short an absence of free HCl and a low total acidity is very suggestive.

In speaking of the X-ray examination of the intestinal tract after opaque meals, tribute must be paid to the pioneer work done in this country by Jordan in the face of many difficulties, and to the eminently sane writings of a former house surgeon of mine, A. E. Barclay.

Much work has been done recently, particularly in the United States, on the diagnosis of carcinoma of the stomach by this means. Under the conditions of hospital work in London, where each surgeon works alone with control of a relatively small number of beds, without permanent skilled assistants, and shares with his numerous colleagues the help so willingly given by the physician in charge of the X-ray department, who has to deal with every branch of this subject, it is impossible to emulate this. Financial considerations also prevent cases being examined by Cole's method of serial Roëntgenography. Carman has stated that X-ray examination showed diagnostic signs in 93 per cent. of the cases of carcinoma of the stomach at the Mayo Clinic, Rochester. Those who know the enormous material and facilities for research at this institute, with the close co-operation that exists between the surgeon and other workers, realise that very special facilities exist for

³*The Practitioner*, March, 1913.

examination of this nature. Until radical changes have taken place in the methods of medical work in this country it is impossible for surgeons to hope to obtain such help.

The diagnosis by this examination depends upon the interpretation of the mechanical changes produced by the growth, in the outline of the stomach (filling defects), alterations in the peristalsis and variations from the normal in the time taken in emptying.

My experience of the results has been disappointing. I say this knowing the hindrances under which such work is carried on. In advanced cases and those in which a stricture is present, either at the pylorus, in the body of the stomach or cardia, it gives corroborative evidence, but I have never yet been helped to the diagnosis of malignant disease of the stomach or its operability by this means.

I have found it more helpful in excluding the possibility of advanced disease. For example, a patient was recently sent to me as carcinoma of the stomach with a fourteen months' history of vague irregular discomfort after food. X-ray examination showed no filling defects or local arrest of peristaltic wave. Operation revealed chronic appendicitis, and no organic gastric lesion.

The importance of a very careful physical examination is obvious. A rectal examination should never be omitted. I have several times been saved from useless exploration by the discovery of pelvic deposits by this means.

If carcinoma of the stomach is suspected, or even if it can be definitely diagnosed, provided there are no contra-indications to operation such as secondary deposits, exploration should be carried out.

Even when a large tumour is present I never refuse the patient the benefit of exploration; in the most hopeless looking patients operation may prove to be feasible, or, as has not infrequently happened, the condition proves to be simple.

As an example of the first, I operated 5½ years ago on a man who had been seen by another surgeon, who expressed the

opinion that nothing could be gained by operation. The patient was 52 years of age, and of the cachectic appearance commonly associated with an advanced stage of malignant disease. A cylindrical swelling was present in the epigastric region. In spite of the fact that I had to remove a portion of the pancreas in addition to two-thirds of the stomach, the result has been most satisfactory. He is alive and in good health at the present time. Microscopical examination confirmed the diagnosis of carcinoma of the stomach, with secondary deposits in the subpyloric glands.

In several other cases in which palpable tumours have been present it has been possible to carry out partial gastrectomy.

Again, in spite of the greatest care in the clinical examination, the tumour felt may not be malignant.

In December, 1911, I saw a woman of 48 with a history of attacks of indigestion extending over 26 years. These consisted of epigastric pain thirty minutes after food, relieved by vomiting.

On examination a rounded swelling was felt in the epigastric region, extending from under the thorax, moving on respiration. Test meal: free HCl '09, total acidity 51. Her history, taken together with the test meal, pointed very strongly to the diagnosis of carcinoma of the stomach, supervening on a chronic ulcer.

At the operation on December 27th I found a rounded mass the size of a foetal head, intimately associated with the lesser omentum, firmly fixed to the stomach below and the liver above. On separating it from the stomach I found that it was springing from the under surface of the right lobe of the liver. It proved to be an hydatid cyst, which had become pedunculated, so that I was able to remove it completely by cutting through a thin portion of liver tissue. I found a thickened gall bladder containing stones. The ducts were free. I performed cholecystectomy. She remains quite well.

Recently I had another very instructive case. In June of this year a woman, aged 59, was sent to me with a diagnosis of carcinoma. For 6—7 years she had attacks of pain half an

hour after food, relieved by vomiting. These were separated by intervals of perfect health until the preceding five or six months, during which time there had been no intermission. Physical examination revealed a swelling in the left hypochondrium, giving the characteristic features of a stomach tumour.

The test meal showed an absence of free HCl, and a total acidity of 18. The report of the bismuth examination was as follows.

“Irregularity in outline of the stomach about the centre of the body, involving lesser and greater curvatures. Right lobe of liver enlarged upwards. Twenty-four hours later bismuth seen in colon, which seems to be fixed.

“Conclusions. Extensive involvement of the stomach by new growth, secondary deposits in the liver, ? in mesentery. No pyloric stenosis.”

At operation I found a large saddle-shaped ulcer of the lesser curvature of the stomach, which had produced an hour glass stomach. Its anterior portion had perforated, and its floor was formed of abdominal wall. I excised it, and did my anterior no-loop gastro-jejunostomy⁴ to a small cardiac pouch. She made an uneventful recovery.

Serial sections of the ulcer were cut, and no evidence of malignancy discovered.

Although before operation apparently a hopeless case, operation afforded absolute relief and probable cure. As the condition had produced an hour-glass stomach, the test meal was of no value in coming to a diagnosis.

I operated upon a somewhat similar case five years ago. A woman of 49, who had attacks of typical gastric ulcer for four years; during the preceding five years there had been no remission. An abdominal tumour had been noticed for four months. She was very anæmic and wasted, and there was an ill-defined swelling beneath the left lower ribs.

Two test meals showed an absence of free HCl. At operation, August 24, 1910, I found the stomach adherent to the abdominal wall, and on separating it I found a perforation of

⁴ Choyce's System of Surgery. Vol. ii., p. 408.

the anterior part of a saddle-shaped ulcer, which had produced an hour glass stomach with a small cardiac pouch. After excision I did a gastro-jejunostomy. She is now, and has remained, in perfect health.

Among 31 cases of simple hour-glass stomach that I have operated upon, eight were sent with a diagnosis of carcinoma, and in five of these a tumour was present. In these cases the ulcer had perforated, and was adherent to the abdominal wall in four, to the falciform ligament in one.

Great relief occasionally results in inoperable carcinoma from exploration alone. I have recorded examples of this, in which the patient was free from symptoms for fourteen to thirty months after exploration for a condition proved microscopically to be gastric carcinoma.

As the conditions which may simulate and complicate surgical gastric diseases arise in connection with organs in the right half of the abdomen, I make my incision about an inch from the middle line on this side; the anterior sheath of the rectus is then incised, the inner border of the muscle freed and drawn out, and the abdominal cavity opened in a line with the skin incision. This can be enlarged as far as is necessary without endangering the strength of the abdominal wall.

The stomach should be first examined from end to end. As I have previously mentioned, cases of hour-glass stomach are by no means infrequently mistaken for carcinoma developing on ulcer; the more or less constant discomfort, the irregularity of the pain when the condition is advanced, and the usual low acidity and absence of free HCl all lead to this supposition. The ease with which a small cardiac pouch may be overlooked must not be forgotten.

Malignancy may at once be obvious from the presence of deposits in the stomach at a distance from the ulcer or in the liver. When removal is impossible gastro-jejunostomy should only be carried out in the presence of obstruction. In a few cases in which for special reasons every attempt must be made to prolong life, even in great discomfort, jejunostomy may be carried out.

Careful examination of the ulcer may reveal the stigmata of malignancy, opaque white patches of peritoneum, a nodular edge, the presence of small hard lymphatic glands. If the ulcer is only "suspicious" my present practice is to treat it as malignant. I have in a few cases been enabled to make the diagnosis through having a rapid microscope section made of the tissue removed; but this may fail to pass through the malignant area, and cannot be considered conclusive. Excision of the ulcer and gastro-jejunostomy, to be followed by a second operation if the condition is found to be malignant, are not recommended. The risk of a second anæsthetic and the possible refusal of the patient to submit to a second operation, far outweigh the small increase of risk involved in the more extensive operation of partial gastrectomy. In three of my earlier cases in which I performed gastro-jejunostomy as part of a two-stage procedure, the patients refused subsequent operation, and died 10, 15, and 18 months later. Both were easily removable.

The operation of choice is partial gastrectomy. When the carcinoma is situated in its usual position on the lesser curvature it is sufficient to remove that part of the stomach situated to the pyloric side of a line drawn through the right side of the cardiac orifice, together with the omenta attached and their contained lymphatic glands. The duodenum is closed, and the continuity of the alimentary canal restored. But here, as elsewhere, the day of set operation is over, each case must be treated as it needs.

For over four years I have been anastomosing the jejunum, close to the duodeno-jejunal flexure, directly to the stomach, not closing this and doing a separate gastro-jejunostomy.

Until recently I was of the opinion that the operation was original, but as is so often the case in alterations in technique, similar ideas occurred to others. The method, although published in 1911, was not widely known. When I was in Rochester in the early part of last year I found that even here, where most of the changes in technique were quickly known and

tested, it had not been heard of. I mentioned it to Dr. W. J. Mayo, who wrote in July with regard to it :—

“ When you were here you told me that after removing the section of stomach in partial gastrectomies you closed the duodenum and then made an anastomosis between the end of the stomach and side of jejunum. I have done five cases in this way, and found it very satisfactory. Can you tell me whose method it is?”

I then went into the matter, and found that Pólya⁵ was the first surgeon to publish an account of this method. W. J. Mayo⁶ then gave the results of his experience in twelve cases.

I have found this operation most satisfactory, and can thoroughly recommend it as superior to the more usually employed Billroth II. Time is saved, a matter of great importance in these cases, the whole procedure usually taking from forty to fifty minutes, and convalescence is smooth.

I have had up to the present no personal experience of radical operation in disease affecting the cardiac end of the stomach.

The percentage of cases in which radical operation can be carried out must vary at every clinic. Out of the 153 in which the diagnosis was made before or at operation in only 34 was I able to perform partial gastrectomy. Of the 104 cases with a history of less than two years' duration—that is, those with a previous clean gastric history—only 10 were suitable for radical treatment. The remaining 24 were from the 49 whose history pointed to previous gastric disease.

Adding the six cases in which the diagnosis of malignancy was only made by microscopic examination of the specimen brings the number treated in this way to 40, with an operative death rate of four; that is, four deaths arose directly out of the operation. The remainder were able to leave the hospital or nursing home.

The after results are encouraging, if we remember that the majority of patients in whom the disease cannot be surgically

⁵ Pólya, *Zentralblatt für Chirurgie*, 1911, Nr. 26, p. 892.

⁶ Mayo, *Surgery, Gynecology and Obstetrics*, Dec., 1914, p. 688.

treated die within twelve months of the onset of symptoms. Of the 36 who survived operation 16 are alive and well more than a year after operation, 2 over five, 1 over four, 1 over three, and 2 over two; 6 have been done less than a year. The remainder died from recurrence, the earliest three months, the latest 30 months after operation, the average in these cases being about 18 months.

The relief given is usually absolute, and even after recurrence death does not often occur from direct gastric involvement.

Gastro-jejunostomy is an operation that has been greatly abused, in the palliative treatment of carcinoma of the stomach no less than in secondary gastro-disturbance due to disease at a distance.

It is only indicated in the palliative treatment of carcinoma of the stomach in the presence of mechanical obstruction, and here gives striking relief.

The immediate death rate is much higher than when performed for simple conditions. I have carried it out 44 times, with seven deaths. The average duration of life is six months. The longest survival was three years; several have lived in comfort for over 18 months.

In conclusion, I would emphasise the utmost importance of endeavouring to get the primary cases early. Ten "radical" operations among 104 explored is a striking commentary on the necessity for this. I look forward to the time when the figures will equal those at present obtained in the cases secondary to gastric ulcer, and the necessity for operation for malignant disease in this group will have disappeared.

NOTES AND NEWS.

UNIVERSITY OF BIRMINGHAM.

THE Ingleby Lectures were delivered at the University on November 3 and 10 by Professor Douglas Stanley. The subject was "Pneumonia and Its Sequelæ in Children."

Professor Robert Saundby, M.D., F.R.C.P., LL.D., has been re-appointed representative of the University on the General Medical Council for the year 1915-16.

The Officers' Training Corps.

Much strenuous work is being done for the war in the departments of chemistry, physics, medicine, and engineering; but the quickest and most tangible results are probably being obtained from the work of the Officers' Training Corps. After a few months of thorough training and instruction in the corps, students are able to take commissions in the army, and all men students are urged in the following notice, which has been posted in the University, to avail themselves to serve in the army as commissioned officers :—

"The Council of the University wishes to impress on the men students the importance of their joining the Officers' Training Corps. The demand for additional officers in the army is likely to become increasingly urgent, and students joining the Officers' Training Corps now will prepare themselves to render valuable service when the call comes, and when they wish to place themselves side by side with their fellow students who are already serving."

This notice is signed by Mr. Gilbert Barling (Vice-Chancellor), Sir Oliver Lodge (Principal), and Mr. Neville Chamberlain (Chairman of the Military Education Committee).

The following promotions have recently been made in the Officers' Training Corps :—To Sergeant, Lance-Corporal Pendlebury ; to Corporals, Lance-Corporal Bishop, Lance-corporal C. Hoggs ; to Lance-Corporal, E. V. Jones, W. H. Jackson, H. G. Jackson, R. Woolcott, G. E. Willstead, W. H. Hoile, G. L. Tucker. Corporal Masters and Cadet Pounteney have obtained commissions.

Mr. W. Ward Law, M.Sc. (Durham) has been appointed as an assistant lecturer and demonstrator in chemistry.

Miss Mary Gilson and Mr. Alfred Paine have been appointed prosectors in anatomy.

ROYAL ARMY MEDICAL CORPS.

THE following announcements have recently appeared in the *London Gazette* :—

Southern General Hospital.—G. R. Girdlestone, M.B., F.R.C.S., to be captain, whose services will be available on mobilisation (October 23).

Southern General Hospital.—J. Gardiner to be captain, whose services will be available on mobilisation (November 9).

Southern General Hospital.—Major J. T. J. Morrison, M.B., F.R.C.S., to be lieutenant-colonel (November 14).

S. Midland Mounted Brigade Field Ambulance.—The date of appointment of Lieut. S. P. Johnson, M.B., is September 24, and not as stated in the *London Gazette* of October 1.

N. Midland Field Ambulance.—T. E. A. Carr, M.B., (late temporary lieutenant, R.A.M.C.), to be lieutenant (September 17).

N. Midland Field Ambulance.—Capt. W. McC. Wanklyn, from deputy assistant director of medical services, to be captain (November 9).

S. Midland Field Ambulance.—Lieut. E. Whichello, M.B., to be captain (Oct. 16).

S. Midland Field Ambulance.—Surgeon-Capt. G. Mackie, from S. Mid. Brig. R.F.A., to be captain ((November 16); Capt. G. Mackie to be temporary major (Nov. 16).

S. Midland Casualty Clearing Station.—Lieut. A. B. Prosser, M.B., to be captain (October 27).

DISTINCTION FOR THE SON OF A LICHFIELD PRACTITIONER.

LIEUTENANT (TEMPORARY CAPTAIN) PATRICK ELIOT WELCHMAN, 1/2 North Midland Field Company Royal Engineers, Territorial Force, who has been awarded the Military Cross for conspicuous gallantry and devotion to duty on October 14, at the Hohenzollern redoubt, is the eldest son of Dr. Eliot W. Welchman, who was mayor of Lichfield in 1906. He is an old Lichfield Grammar School boy, and was formerly engaged in the local office of a bank. For his services in the field he was promoted to the rank of temporary captain in June.

BRITISH WORKMEN OR MENTAL DEMENTS?

THE Lord Mayor of Birmingham, Alderman W. H. Bowater, in distributing the cheques to the representatives of various hospitals and nursing societies on behalf of the Hospital Saturday Fund, made a most interesting speech. He pointed out that the workers throughout the city had risen to the occasion and come to the conclusion that Hospital Saturday must not suffer by the war. In the present year more than ever was the help of the citizens needed by the hospitals, and the results of the collections justified the expectation that the sum raised would this year exceed £23,000. The Lord Mayor then proceeded to state that the new Children's Hospital at Ladywood, planned to accommodate 216 children, had for nearly twelve months been left in a state of incompleteness because "the plumbers engaged went on strike for the reason that they could not agree with the hot-water engineers as to who should finish the hot-water fittings." In fact, a new hospital had been prepared, the site secured, the foundation-stone laid by Royalty, a

sum of £30,000 collected, and the erection proceeded with almost to completion, when the plumbers and hot-water engineers stopped the works. They had for many months deprived the people of Birmingham of the comfort and protection of a magnificent hospital, which would have provided for the treatment of hundreds of sick children belonging to the workers. To make the matter worse, the action of these artisans had prevented the old Children's Hospital buildings being available for the treatment of sick and wounded soldiers, for whom accommodation had to be provided at a further loss to the children and their parents from the closing of three elementary schools and an expenditure of thousands of pounds to turn the latter into hospitals for the soldiers. On behalf of the citizens, might not the medical profession of Birmingham meet and appoint five of the ablest men amongst them to hold an inquiry into the sanity of the plumbers and hot-water engineers in question? They might find it possible to protect the citizens from further follies and dangers of the kind. No such inhuman folly would have been tolerated in the days of Joseph Chamberlain, for Birmingham men in his day were famed for their intelligence, their citizenship, and their power and will to deal with cranks by cutting their cackle.—(*The Hospital.*)

BOOK REVIEWS.

The Early Diagnosis of Heart Failure and other Essays. By
T. STACEY WILSON, M.D., F.R.C.P., B.Sc. London :
Smith, Elder & Co. 1915. Price 12s. 6d. net.

A NEW book on Heart Disease by a physician of established reputation and of wide clinical experience must always be a matter of great interest to heart specialists, general physicians, and family practitioners alike. It is right to say at once that this book of Dr. Stacey Wilson's is a valuable one. It contains new and controversial matter to challenge the attention of those who are working out the problems of cardiac pathology and symptomatology; it describes means whereby to estimate the condition of the heart in disease which cannot but be of interest to every physician, and it is full of practical advice both as to diagnosis and treatment which should be of great value to the general practitioner. The early diagnosis of heart failure is one of the most important duties of every family doctor, and often one of the most difficult, and he should be grateful for help such as this book gives. Very much work has been done of late years on diseases of the heart, and it has been of the utmost value, but most of it has been by means of special instruments, and by the employment of the so-called graphic methods, and though it is right and necessary that all practitioners should be aware of this new knowledge, and that all students should be taught to understand these new methods and to master the results obtained thereby their actual use is quite beyond the scope of the busy family practitioner, and often even of the busy general physician. Our author takes us back to the older methods of physical signs observable by every well trained medical man, to anatomical rather than physiological considerations; and his work shows how valuable these methods may still be, and how important it is that they should not be neglected. His book is

made up of a number of distinct essays, written at varying times, and involving therefore a considerable amount of repetition. The same leading ideas characterise most of these essays.

He dwells especially on the difference in the distensibility of the heart at various ages and in different individuals, and the great variations in the effect of strain on the heart and on the various parts of the heart in accordance with these differences. We have never seen the differences in distensibility so strongly emphasised or so clearly described, and Dr. Stacey Wilson has certainly demonstrated the importance of this subject. He traces the changes from early life, when the muscular walls of the heart alone afford resistance to dilatation, and when therefore different parts of the heart dilate to different extents according as this muscular wall varies in its thickness and strength; through middle life, when both muscles and fibrous tissues take their share in this resistance and the heart tends to dilate more equally; and finally in old age, when the cardiac rigidity becomes so great that any dilatation at all becomes almost or perhaps quite impossible; and he describes how this power of resistance and this rigidity can best be estimated at any special age or in any given case. He discusses at length the subject of muscular strength and muscular weakness, and dwells on the increasing difficulty in estimating these as age advances. His chapters on "Heart Failure Without Enlargement" are exceedingly interesting, and he shows how both in cases of great cardiac rigidity and also of great weakness of the cardiac muscle the heart may altogether fail to dilate under strain, and may even in the latter case diminish in size, and show clinical signs of this diminution.

Very interesting also are his chapters on "High Diaphragm as a sign of Diminished Blood Volume" and on "Diminution of the Area of the Liver Dulness as an important sign of myocardial weakness or of deficiency in the total volume of the Blood." These chapters require careful study, and will recompense it. The author attaches much importance to the ideas therein set forth. They will probably evoke much controversy. Should they ultimately win their way and be

universally accepted we shall be furnished with new clinical signs of great value; but we must remember that the great masters of the past have in all probability considered them, and rejected them as untrustworthy. At the present day, however, our knowledge of the heart in disease has so notably increased—thanks especially to the graphic methods, to the electric cardiograph, and to radiography—that we must be willing most carefully to reconsider all our previous ideas.

Another very interesting chapter is that on “The Expansion Phase of the Cardiac Cycle,” in which Dr. Wilson discusses the evidence for the belief, which he strongly holds, that the phase of ventricular contraction is followed by an active expansion movement, and that so far as the reception of the main part of their charge is concerned the ventricles are not dependent on the auricles or other outside agency. In his next chapter he considers this active diastolic expansion movement as a factor in compensation for disease of the mitral valve.

The section dealing with the diagnostic value of venous phenomena, always a difficult subject, is clearly and well written. Dr. Stacey Wilson dwells strongly on the importance of the auriculo-venous reservoir constituted by the right auricle, the superior vena cava, the innominate veins, the first part of the subclavian veins, and the vena azygos and its branches. He describes its pathological changes in disease of the heart, and how these may be recognized and duly estimated clinically. He lays great stress on the study of this reservoir, both directly through the jugular bulb and indirectly in other ways, and he considers that in later life jugular bulb pulsation is a surer guide to the strength of the right ventricle than the arterial pulse is to that of the left.

Another favourite theme of the author's is “The Compensatory Diminution in the Volume of the Blood.” This diminution, he tells us, occurs, and may be observed clinically not only in cases of starvation, or loss of blood, but also as a compensatory phenomenon in cases of cardiac weakness and inefficiency. In these cases he considers that while the total quantity of blood in the body may not always be absolutely less

the amount in actual circulation is certainly diminished, some of it being stored away in some part of the body for the time being.

Dr. Wilson carefully points out that in severe cases of heart failure the enlargement of a small heart may be a sign of returning strength, and shows how the physical signs of the return of strength in a weak heart may closely resemble, or even be the same as, those of failure in a strong heart, a fact which if not sufficiently recognised may easily lead to errors not only of diagnosis, but also of treatment. He tells us that in later life we often have to depend more upon the symptoms of heart failure than upon the signs; and then he goes on to show how these symptoms themselves may often be misleading if we are not aware of the many pitfalls. Probably after all in these difficult cases when the consideration of physical signs alone, or of symptoms alone, or even of signs and symptoms together, may so easily lead us astray the simplest and safest criterion is the power of response of the heart to effort, which if carefully watched will be a safe guide.

Dr. Wilson insists on the importance of leg pains and cramps on exertion, and also of coldness of the feet and legs on exertion as symptoms of myocardial weakness of the left ventricle, and his chapter on Leg Pains, due to deficient blood supply, is a most instructive one. In it he discusses the phenomena of intermittent claudication, which he considers may be due not only to arteritis obliterans, but also, though to a less marked degree, to vasomotor disturbances, especially to vasomotor spasm. His chapter on Pallor as a Symptom of Heart Failure is also a very suggestive one.

Among other minor points to be noticed are his discussion of the causation and importance of the ordinary pulmonary systolic murmur so commonly heard in anæmia; his description of the conduction of mitral murmurs down the spine, the recognition of which he considers important both for diagnosis and prognosis; his opinions as to vasomotor angina and reflex angina, especially the reflex angina occurring in colon dyspepsia,

and his interesting suggestion as to the possible safety valve action of the azygos vein and its branches, owing to the imperfection of its valves.

His excursions into what may be called the by-paths of his subject are interesting and helpful; such are his *obiter dicta* on colon-dyspepsia, neurasthenia, thyroid insufficiency, reverberation in gastric disease, gastric massage, and leg pains due to dilated deep veins in the thigh. Here we come across the practical physician, such a man as we should expect to find in a city like Birmingham, a man who can give us not only interesting and stimulating food for thought, but also detailed practical advice of the highest value.

Dr. Wilson has not only given us a most useful subject index, but also a very careful summary of the arguments and facts brought forward in his book, a summary which enables us to find out rapidly what his views are on any part of his subject, and to turn to the arguments which he has adduced in support of these views. The book is illustrated by a series of excellent diagrams and by a few useful photographs, and his theses are elucidated by many careful accounts of interesting and striking cases.

The book is a good book, though it hardly confines itself to its title, "The *Early* Diagnosis of Heart Failure," but it suffers perhaps from too little unity of purpose. It contains much that is controversial, and the author's views are strongly and cleverly put, and many of them will probably carry conviction; also much useful clinical teaching on heart disease, with which probably all authorities will agree; and finally, many wise and enlightening remarks on what we may call side subjects—wise and enlightening because they embody the experience gained by a thoughtful physician in his many years of practice. But these three things hardly go well together. Those—the majority—who will be glad of his clinical teaching *re* heart disease, based as it is on years of experience and careful study, do not want, and perhaps are unable to appreciate, his arguments on the controversial subjects, while those who are working out the problems of heart disease will be interested in his arguments

and in the clinical cases and facts which he brings forward to prove them, but do not in the least want his practical teaching. Others there are, men practising "Internal Medicine," who will care for neither of these, but who will welcome the scattered expressions of opinion on wider medical subjects, opinions which are the fruit of years of patient work and quiet thought and accumulated experience, and are therefore far more valuable to them than the cleverest arguments. The volume before us contains matter which would go far to make three good books, each one of which would be in its own way more useful than the present one.

Diseases of the Nervous System. By H. CAMPBELL THOMSON, M.D., F.R.C.P. Third Edition. Price 10s. 6d. net. London : Cassell & Co., Ltd. 1915.

A SECOND edition of this extremely serviceable work has been called for within a few years of its first appearance. During this time, however, the advances in the study of nervous diseases have been important and numerous, and the extent of these advances is reflected in the revision and additions necessitated in this volume. The investigations which have led to the division of syphilis of the nervous system into interstitial and parenchymatous form have necessitated a reconstruction of this part of the book so that Tabes and General Paralysis might fall into their places according to their etiology. New chapters on the general functions of the brain, the examinations of the higher functions of the nervous system by the application of experimental psychology, the sympathetic system and the paths of infection of the central nervous system have been inserted, while the section which deals with the classification of neurosis has been enlarged. In addition several new plates and figures have been introduced. The work retains its salient features as a student's textbook, but it also forms an admirable introduction to the post-graduate study of neurology, and practitioners will find it a handy and trustworthy guide in practice

The section on the examination of the higher functions of the nervous system by experimental psychology is suggestive, and should be extended, as it should prove of considerable utility to those who are concerned in the administration of the Mental Deficiency Act. We think that some of the tests generally used in investigating cases of mental deficiency should be included in a work of this sort.

The illustrations (10 colour and 12 black-and-white plates and 120 figures in the text) are well executed and judiciously chosen to elucidate the text. The book is attractively produced and it is written in an easy style, which is entertaining and convincing. It forms a valuable addition to the student's and practitioner's library.

Life : A Poem. By BASIL GORDON MORISON. London :
Baillière, Tindal & Cox. Price 3s. 6d. net.

THIS poem of fifty-five four-line verses was written by a practitioner residing in the North London district. In spite of a busy and strenuous life, he found time in his later years to jot down some of his more serious thoughts. The poem has been edited by someone who has written a preface and added a biographical memoir ; who prefers to remain anonymous, and to whom the task has evidently been a labour of love. The verses themselves take the form of a dialogue between Man and the Spirit of Life, and in places faintly recall the quatrains of Omar. Although not free from faults of technique, the poem is impressive, and contains many beautiful and suggestive thoughts. It would perhaps have been kinder to have omitted the alternative phrases and verses published at the end of the poem. They show the labour and care expended on the verses, but they also show to what extent unaccustomed hands may be hampered by the exigencies of rhyme and metre. The three following verses serve as good examples, and are amongst the best in the poem :—

III.

Soon vigour in the shapeliness of Youth
Moves beautiful and strong upon thy way,
And Thought, awakened like a seed of Truth,
Grows in the knowledge of a widening day.

XLI. AND XLII.

Sunk in rude waste and idle darkness deep,
Treasures of skill and powers unquickened lie,
Till at the shock of Toil their night of sleep
Is fled away, their waking morn come nigh :
Then forth compelled and wrought in otherwise,
With added values and endowments new,
By mounting grades of service they shall rise,
And their perfection prove the making true.

A "Song of the Union" and "A Prayer" have been included in the volume. We think that most readers will consider the latter the gem of the whole collection of verses.

A Compendium of the Pharmacopœias and Formularies (Official and Unofficial), with Practical Aids to Prescribing and Dispensing. By C. J. S. THOMPSON. Fifth edition. London : John Bale, Sons & Danielsson, Ltd. ; 1915. Price 5s. net.

THE fifth edition of this well-known pocket-book has been thoroughly revised in accordance with the new British Pharmacopœia of 1914. As a compilation of a very judicious selection of useful facts this work has always been greatly appreciated by medical practitioners and pharmacists, but at the present time international relations are such that it becomes almost indispensable. The synopsis of formulæ from the pharmacopœias of practically all the leading countries in Europe, America and Asia, constitute a fund of useful information which it would be difficult to find in any other single book.

The selections of formulæ from the pharmacopœias of various British institutions have been brought well up to date, and full instructions are given as to the use of the metric system in prescribing.

Many will also find the lists of terms and phrases used in the writing and application of foreign prescriptions extremely appropriate.

There are many other features which are of practical value and the busy practitioner will find it a book to which he will make daily references.

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THE INTRATHECAL INJECTION OF SALVARSANIZED SERUM.

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Hospital, Westminster Bridge, S.E.*

IN 1894 Fournier¹ introduced the term "parasyphilis" to account for cases which appeared to be of syphilitic origin, but which were not amenable to antisymphilitic treatment. Amongst the diseases which he included in this class were tabes dorsalis and general paralysis of the insane. The discovery of the spirochæta pallida by Schaudinn, and the abundant evidence brought forward by Metchnikoff, Neisser, and others to prove that this organism is the specific cause of syphilis opened up new fields for research, and efforts were made to prove the syphilitic origin of the so-called parasyphilitic diseases.

In February, 1913, using Levaditi's silver stain, Noguchi and Moore² were able to show the presence of spirochætes in smears from the grey matter of the brain in twelve out of seventy cases of general paralysis. These results have been confirmed and extended by Mott³. Recently McIntosh⁴, by using a dark ground illumination, has been still more successful, and has demonstrated the presence of spirochætes in smears from the grey matter of most of the brains of general paralytics which he has examined, though the spirochætes were much more difficult to find in sections of the brain.

These discoveries conclusively proved the syphilitic origin of the diseases under consideration, and the term "parasyphilitic" becomes nothing more than a clinical conception which comprises the manifestations of a series of diseased states, these states depending upon the reaction of the hypersensitised tissues to the spirochæte or its toxins, and this reaction is as truly syphilitic as the production of gummata⁵.

The syphilitic origin of tabes dorsalis and general paralysis of the insane being proved, it is found that the diseases of the central nervous system which are attributable to the *spirochæta pallida* fall into two classes.

(1) *Interstitial*. The meninges, blood vessels and neuroglia are affected, the neurons being secondarily involved. The disease generally occurs about two years after infection, following a virulent attack more frequently than a mild one. This variety is amenable to antisiphilitic treatment, as the connective tissue is capable of repair, and the focus is readily reached by the remedial agents.

(2) *Parenchymatous*. This class contains the diseases which formerly were called parasiphilitic, that is, tabes dorsalis, tabo-paresis, etc. The symptoms begin insidiously about twelve years after infection. The infection is usually a mild one, secondary specific symptoms not developing, and the whole course is often run under cover of an attack of gonorrhœa. The morbid processes steadily progress to a fatal termination. This is due to a continuation of the syphilitic process in spite of treatment, and not to a progressive primary degeneration of the neurons.⁶

The outstanding feature of diseases in this class is the failure of antisiphilitic treatment to improve or cure the condition. Mercury by mouth or inunction, potassium iodide, arsenic, antimony, etc., have all been tried without any marked success. The introduction of salvarsan gave rise to hopes that a cure had at last been found for **these** diseases, which are so distressing to patient and physician alike. Unfortunately the hopes entertained of this treatment were not realised, and although injections of salvarsan are nearly always given to patients suffering from tabes dorsalis, very little improvement, and that only temporary, is derived, whether the drug be given subcutaneously or intravenously.

At first sight it seems strange that antisiphilitic treatment should have so little effect, but a careful consideration of the cerebro-spinal fluid gives us one of the clues to this apparent anomaly.

The Cerebro-spinal Fluid.—The cerebro-spinal fluid is secreted by the choroid-plexus, which exerts a selective action, preventing the passage of many drugs and antibodies into the cerebro-spinal fluid⁷. In proof of this are the facts :—(1) That the spinal cord and fluid do not become stained in jaundice ; (2) that mercury and arsenic are not present, or only in minute traces after the patient has been taking the drug for some time⁸ ; and (3) that if trypan blue be injected intravenously the cord or fluid does not become stained.

J. Magalhaes⁹, working with atoxyl, brought a large amount of evidence forward to show that arsenic was not liberated in the cerebro-spinal fluid after intravenous injections, but his results have been criticised by Nierenstein¹⁰, who, examining the cerebro-spinal fluid from donkeys which had been infected by trypanosomes and then treated with intravenous injections of atoxyl, found arsenic present in five out of eight cases.

In the ensuing series of cases both the blood and cerebro-spinal fluid was examined twenty-four hours after the injection of neo-salvarsan, and the results obtained showed that arsenic was present in abundance in the blood, but was absent or present only in the minutest trace in the cerebro-spinal fluid. There were two exceptions, to one of which, case three, reference will be made in due course.

Method of examination for presence of arsenic.—The following method was used for examining the blood and cerebro-spinal fluid for the presence of arsenic. 10 c.c. of the fluid to be tested was placed in a Kjeldahl flask and 10 c.c. of concentrated sulphuric acid added. The fluid was then boiled on a sand bath for three hours.

A modification of Gutzeit's method was then employed¹¹. Marsh's apparatus, fitted with a tube with a side hole, the latter containing a plug saturated with lead acetate, was used for the generation of hydrogen. The apparatus contained the following :—

- 10 grams. zinc.
- 50 c.c. of water.
- 10 c.c. of hydrochloric acid containing 1 per cent. stannous chloride solution.

These substances were tested first, and the absence of arsenic proved. The contents of the Kjeldahl flask were then poured into the apparatus. Filter paper saturated with a 2 per cent. solution of mercuric chloride was held over the end of the tube for 5, 10, 15, and 20 minutes, and the change of colour noted.

The reaction which occurs is possibly as follows¹² :—

$2 \text{ As H}_3 + 6 \text{ Hg Cl}_2 + 6 \text{ H}_2\text{O} = 2 \text{ H}_3\text{AsO}_3 + 12 \text{ HCl} + 3 \text{ Hg}_2$,
but according to White and Humphrey³² the yellow stain may be due to the production of a substance having the formula AsH (Hg Cl)_2 .

The more abundant the arsenic is, the more intense is the yellowish-brown colour produced on the filter paper moistened with mercuric chloride, and the greater the length of time during which the reaction can be obtained.

Three experiments were performed to find out when the greatest percentage of arsenic was present in the blood. An intravenous injection of neo-salvarsan was given, and blood withdrawn from the patient 12, 24, and 36 hours after the injection, and examined by the above method. Contrary to expectation, the blood withdrawn 24 hours after the injection revealed the greatest quantity of arsenic. More experiments are required before this can be confidently affirmed, but on account of this, and so as to save the patient too much manipulation on the same day, the blood from which the serum was obtained for the intrathecal injections in the following cases was withdrawn 24 hours after the injection of the neo-salvarsan.

The combination of arsenic with the serum proteins.—Intravenous injections of salvarsan seem to be powerless in combating this disease, owing to the fact that the arsenic does not reach the spirochætes.

To get over this difficulty Ravaut¹³ gave injections of neo-salvarsan directly into the spinal theca. He found that it was impossible to make use of the old salvarsan, as the soda, which must be added in order to dissolve it, rendered the solution too irritant, and caused a precipitate in the cerebro-spinal fluid. He employed a 6 per cent. solution of neo-salvarsan, each drop of

this solution containing 3 mg. of the salt and being hypertonic in the cerebro-spinal fluid. From 3 to 12 mg. are injected through a fine needle. His results of nine reported cases are not very decisive, and this method is now rarely used. From this it may be concluded that there is some other factor necessary before the arsenic in salvarsan or neo-salvarsan can have the desired effect upon the spirochætes, and a consideration of the researches of Nierenstein, Todd, and Moore seems to throw light upon this factor. These observers came to the conclusion that the action of the organic compounds of arsenic, such as atoxyl, was a specific one, and due to a peculiarly constituted ion containing organic arsenic; that is, that its action was due to direct and specific action of a complex organic ion containing both the aniline and arsenic groups.¹⁴

In an attempt to produce an active immunity against "Ngana" they injected mixtures of atoxyl and trypanosomes, after different periods of contact, into various animals, but they invariably found that the animals became infected after a normal incubation period¹⁵. Injections of atoxyl in previously infected animals, however, had a most beneficial effect. This fact seemed to suggest that the beneficial action of atoxyl in this disease was the result of a co-operation between the living tissues and the drug.

From independent experiments a similar conclusion was arrived at by Uhlenhuth, Hubner, and Woithe.¹⁶

It was found that atoxyl had no effect upon trypanosomes in vitro, but that a strongly trypanocidal compound could be formed by allowing atoxyl, or any organic compound of arsenic which contained an aniline grouping, to combine with serum proteins. On the other hand no such combination occurred between the proteins and such compounds as sodium arsenate, acetyl-benzoyl-atoxyl, or sodium-p-hydroxyl phenyl arsenate (compounds which do not contain an aniline group), and these drugs failed to act upon trypanosomes¹⁷.

Ehrlich has compared the action of a drug to that of a dye¹⁸. We know that it is necessary for a dye to possess a chromophoric group—a chemical radical which causes it to be

coloured, and a chromogenic group, which renders it a dye. Applying this theory to the therapeutics of the arsenical compounds we find that sodium phenyl arsenate $C_6H_5AsO<\overset{ONa}{OH}$ and sodium-p-hydroxy-phenyl arsenate $OH-C_6H_4AsO<\overset{ONa}{OH}$ do not combine with the serum proteins, and possess no curative properties; whereas both atoxyl $NH_2-C_6H_4AsO<\overset{ONa}{OH}$ and mono-acetylated atoxyl $CH_3CO-NH-C_6H_4AsO<\overset{ONa}{OH}$ combine, and are curative, whilst acetylated and benzoylated atoxyl $\overset{CH_3CO}{C_6H_4CO}-NC_6H_5AsO<\overset{ONa}{OH}$ does neither.

Hence it has been suggested that in atoxyl the amido group (NH_2), and in mono-acetylated atoxyl the imido group (NH) play the same rôle as the chromogenic group in a dye, and therefore there is reason to believe that the effective part of these drugs is not only the arsenic, but also the amido group, the latter grouping combining with the serum proteins.

Levaditi and Yamanouchi¹⁹ succeeded by the action of animal tissue, especially liver, in converting compounds of arsenic which were previously inactive in vitro into active trypanocidal compounds, these active trypanocidal compounds being regarded by them as combinations between the arsenical compound and the protein.

It has been shown that for an arsenic compound to have any trypanocidal effect, inorganic arsenic must be present, so that it has been suggested that the action of these drugs is as follows. The organic arsenical compound combines with the serum proteins by means of the amido group and by the action of oxidising agents (in vitro liver emulsion or hydrogen peroxide) upon this compound inorganic arsenic is set free.

Ehrlich²⁰ regards the action of these drugs as being due to the presence of active trivalent arsenic, but there is more evidence in favour of the drugs being oxidised in the body as the arsenic is eliminated in the urine in the form of p-amino-phenyl arsenic acid, oxy-carb-amino-phenyl arsenic acid, etc., all of which are oxidation products.

From a consideration of the foregoing we are in a position to study the rationale of the treatment of spinal syphilis. The cerebro-spinal fluid contains no serum

proteins or only minute quantities, therefore direct injections into the spinal theca failed. The drug must contain, besides organic arsenic, an amido group, and should be injected intravenously first, to allow the necessary combination to take place with the serum proteins. Both salvarsan (dioxy diamido-arsenobenzene-di-hydrochloride) and neo-salvarsan (sodium-dioxy-diamido-arsenobenzene mono-methane sulphonate) fulfil these conditions. The serum derived from the blood then contains arsenic in a form actively trypanocidal, but innocuous to the delicate tissues of the central nervous system, and so forms a safe compound to be introduced into the spinal theca.

It had been observed by Meiorowsky and Hartman²¹ that subcutaneous injections of the blood serum of syphilitic patients who had been successfully treated with salvarsan possessed curative properties. They were able to clear up, by means of these injections, the cutaneous lesions in a congenital syphilitic child, and soon a long list of successful cases was reported. It occurred to Swift that this serum might be made use of for intrathecal injections, and he treated a series of patients by this method²². This was the foundation of the treatment of syphilitic diseases of the central nervous system by intrathecal injections; it was a "bow drawn at a venture" by Swift and Ellis, but I have put forward above reasons why this treatment possesses possibilities of success.

TECHNIQUE.

(a) *The Intravenous Injections.*—In the series of cases about to be considered the preparation of arsenic commonly called Neo-Salvarsan (Meister Lucius and Brünig) was invariably used. The chief advantage of this preparation is its solubility, and some experiments were first conducted to determine the concentration in which this drug might be given without giving rise to symptoms.

The injections were given to patients suffering from the ordinary manifestations of primary, secondary or tertiary syphilis. Commencing with a dose of .45 gram. neo-salvarsan dissolved in 50 c.c. of doubly distilled water the concentration

of the salt was increased in successive injections into a series of patients until the salt was dissolved in 8 c.c. of water only, no untoward symptoms having arisen. The dose of neo-salvarsan was now increased, and it was soon found that .9 gram. of the arsenical salt could be dissolved in 8 c.c. and injected into a vein in this concentration without danger or discomfort to the patient.

Doubly distilled water was invariably used, as experience seemed to show that such symptoms as headache or vomiting either did not occur at all, or were much less severe than when ordinary distilled water was used. The water was always sterilised immediately before use by being brought to the boil for a few minutes, a plug of sterile wool lightly packing the neck of the flask.

The injections were always made with the water at room temperature. The median basilic or median cephalic veins were used, the injection being made with a "record" syringe, and a platinum needle, by means of venepuncture. I wish to lay special stress on this method as opposed to the open operation of incising the skin and dissecting out a vein. This latter method is much more tedious, and, in spite of subcutaneous injections of novocaine or other local anæsthetic, more painful to the patient; but my chief objection to it is that it leaves a scar, which is a distinct blemish to the female arm, and in the male who works for the greater part of the day with his shirt sleeves rolled up, is at once obvious to his employers and fellow workmen. This scar is now being regarded as a certain proof by the "laity" that the possessor of it has had syphilis, and on account of it, with its attendant disadvantages in the way of preventing the man obtaining employment, many patients have refused to have an intravenous injection performed. This difficulty can be overcome by performing the open operation on the leg, but this is not a convenient site and has many other obvious drawbacks.

A little practice will soon convince the physician of the ease and efficacy of the venepuncture. It is essential that the salvarsan solution should be injected into the vein and that

none of it should escape into the surrounding tissues. Should this unfortunately occur, a brawny and painful swelling is formed, which is generally red and inflamed, but I have never seen suppuration ensue. This swelling goes down under treatment with hot dressings but is very painful and distressing while it lasts and it also limits the movement at the elbow joint; a considerable time elapses before it is completely absorbed. If a 10 c.c. syringe be used and the drug dissolved in 8 c.c. of water, there is still 2 c.c. play for the plunger, and after the puncture has been made, the plunger can be withdrawn by this amount, sucking blood from the vein into the syringe, thus making sure that the needle is actually in the vein and not in the subcutaneous tissues.

(b) Preparation of the serum and the intrathecal injection.—

The following method was devised and used in all cases except where otherwise stated. In March, 1914, Campbell²³ published a series of cases, and explained his method, which differed in many respects from that used by the author. Reference will afterwards be made to these differences.

An injection of neo-salvarsan was given to the patient by venepuncture. Twenty-four hours later blood was withdrawn, also by venepuncture, from the median basilic vein of the opposite side. About 60 c.c. were taken, this blood being run direct into sterilised centrifuge tubes. The tubes were then plugged with sterile wool and flamed, and immediately placed in a centrifuge. A specimen of this blood was kept for examination of its arsenic content. After the blood had been centrifugalised the serum was pipetted off.

Lumbar puncture was now performed in the ordinary way, the patient lying on his right side, with his knees well drawn up. An equal quantity of cerebro-spinal fluid to the amount of serum to be injected was withdrawn. The serum was now injected and the needle removed. The cerebro-spinal fluid withdrawn was examined microscopically and for the presence of arsenic. The advantage of this is that only one lumbar puncture is necessary, and further, there is no increase occasioned in the

pressure of the cerebro-spinal fluid. Owing to the low resistant power possessed by the cerebro-spinal fluid and the dire results consequent upon infection of the meninges or the fluid, it is obvious that the whole of the above manipulations must be carried out with the most scrupulous attention to asepsis. The skin of the arms and lumbar region must be cleansed thoroughly before the injections, all instruments, syringes, and tubes most carefully sterilised, and it was my practice to use sterilised rubber gloves throughout the operations.

CASES.

The following is an epitome of the symptoms and physical signs of twelve cases which were treated by the above method ; together with the results obtained.

Seven Cases of Tabes Dorsalis.

CASE 1.—Female, age 38 ; no definite history of infection ; has had three children and no miscarriages.

Symptoms.—Lightning pains for two years. These had been getting worse and at the time of admission occurred daily, preventing her from sleeping at night. Girdle pains and difficulty in micturition. Her pains were unrelieved by any drug except morphia.

Physical Signs.—Inco-ordination and ataxia ; Argyll-Robertson pupil ; absent knee jerks ; “ stocking ” anæsthesia.

Wassermann Reaction.—Positive.

Injections.—Neo-salvarsan .45 gram given intravenously. Twenty-four hours later 8 c.c. of serum obtained from her blood was injected intrathecally by lumbar puncture.

About two hours after the spinal injection, patient experienced severe pain in the legs. The pain either occurred as very acute, in momentary spasms or else was more continuous and of a burning character. The pain was quite different to the lightning pains, running up the limbs, while the lightning pains had been of a shooting character down the limbs. These pains gradually became less and were absent two days later.

Result.—The lightning pains immediately ceased and had not returned three months later. Patient had at first some difficulty in sitting up in bed, but she soon recovered from this. The girdle pains disappeared, and the flow of urine was rather free.

Examination of Blood.—Abundance of arsenic was found in the blood.

No arsenic was detected in the cerebro-spinal fluid.

CASE 2.—Male, aged 54. Occupation, ship's fireman; had gonorrhœa 28 years ago, but no chancre. Wife had two children, one died when twelve months old, the other when a few days old; also one stillborn child and one miscarriage.

Symptoms.—Increasing difficulty in walking during past seven years. Lightning pains began at the same time and were getting worse. They came on about every other day. Gastric crises and great difficulty in passing his water, though he occasionally had incontinence.

Physical Signs.—Absent knee jerks, Argyll-Robertson pupils. Romberg's sign well marked. Patches of anæsthesia over abdomen. Optic discs pale. Typical tabetic walk. The legs were covered with thin tissue paper pigmented scars.

Wassermann's Reaction.—Positive.

Injections.—75 gram neo-salvarsan intravenously; blood withdrawn 24 hours later. The tube containing the serum was accidentally broken. Lumbar puncture performed and 15 c.c. of serum from a patient who had had an intravenous injection of 75 gram neo-salvarsan at the same time injected.

Reaction.—Rise of pulse from 72 to 96. Rise of temperature to 101° F. Considerable amount of pain which became less and finally ceased two days after the injection.

Result.—No further lightning pains or gastric crises. Improvement in walking and general health. No change whatsoever in reflexes.

Examination of Blood, etc.—Arsenic present in the blood and serum. No arsenic present in the cerebro-spinal fluid.

The cells in cerebro-spinal fluid were present in about average numbers.

Count :—Polymorphonuclears	...	2 per cent.
Mononuclears	...	90 per cent.
Endothelials	...	8 per cent.

CASE 3.—Male, age 39; occupation, dentist. Had gonorrhœa sixteen years ago; what was diagnosed and treated as a soft sore fifteen years ago. This sore was followed by secondary specific symptoms, sore throat, rash, and hair falling out, but no specific treatment was administered. Had gonorrhœa again the following year. Wife had two children stillborn, then a miscarriage, then a child which was destroyed owing to difficult labour, and then a premature child, which lived eleven days.

Symptoms.—Lightning pains for eleven years, becoming more frequent and more acute. Eight years ago diplopia, followed by internal strabismus of left eye. Five years ago he began to have difficulty in walking. Three years ago he had three intra-muscular injections of salvarsan, and one intravenous injection, without any relief whatever to his symptoms. Girdle pains started, and were only relieved by morphia. Two years ago he could only walk with extreme difficulty, using sticks, and for the past year he has been confined to bed. Incontinence of urine.

Physical Signs.—Knee jerks absent. Left pupil did not react to light, but to accommodation. Right pupil reacts to both light and accommodation. Ptosis, counteracted by wrinkling of forehead, present. Left internal strabismus. Optic discs pale. Impairment of hearing, a watch being audible three inches away from left ear and a foot away from right.

Glove and stocking anæsthesia.

In-co-ordination of arms and legs well marked. Unable to stand. Astereognosis well marked.

Wassermann's Reaction.—Positive.

Injections. — .75 gram. neo-salvarsan intravenously. Twenty-four hours later 10 c.c. of serum obtained from the blood injected intrathecally.

Result.—Patient felt sick and lost his appetite, but he did not have the characteristic increase of pain. The lightning pains ceased for six days and then began again, and in a month were as severe as before the injection. There was no alteration in control of the bladder or reflexes.

Examination of blood, etc.—No arsenic found in the blood. No arsenic found in the cerebro-spinal fluid. Arsenic present in the urine. The cells in the cerebro-spinal fluid were not abnormal in number or type. Owing to the absence of arsenic in the blood it was thought possible that the patient had been unable to break up the neo-salvarsan, though it was difficult to account for the presence of arsenic in the urine. He was re-admitted, and an intravenous injection of '6 gram. salvarsan given. There was considerable reaction to this. Twenty-four hours later 24 c.c. of serum prepared from the blood were injected into the spinal theca. For the first two days the pains were very severe, but they then diminished, and ceased, only to return fourteen days later.

Examination of blood, etc.—No arsenic present in blood. No arsenic present in cerebro-spinal fluid. Arsenic present in urine up to 96 hours after the injection.

The cells in the cerebro-spinal fluid were mainly mononuclears, but were too few to count.

CASE 4.—Male, 42; occupation, collier; had gonorrhœa 20 years ago. Wife had eight children and no miscarriages.

Symptoms.—Four months ago began to have lightning and girdle pains. These became worse and kept him awake at night. No gastric crises and no interference with micturition.

Physical Signs.—Knee jerks absent. Glove and stocking anæsthesia, and a band encircling the body from Ludwig's angle to the ensiform cartilage. Optic discs pale, but the pupils reacted briskly to accommodation, sluggishly to light. Romberg's sign present.

Wassermann's Reaction.—Positive.

Injections.—75 gram neo-salvarsan intravenously. The blood was withdrawn six hours after injection and allowed to

stand in a sterile bottle for 18 hours (Campbell's method). Lumbar puncture performed and 18 c.c. of serum obtained from the blood injected.

Result.—A rise in pulse rate and a slight rise of temperature followed the intrathecal injection. The lightning pains ceased and patient was discharged feeling much better.

Examination of Blood, etc.—Arsenic present in the blood ; no arsenic present in the cerebro-spinal fluid ; arsenic present in the urine. The cells in the cerebro-spinal fluid were few, but more numerous than normal.

Polymorphonuclears	...	...	5 per cent.
Mononuclears	...	...	85 per cent.
Endothelials	...	...	10 per cent.

CASE 5.—Male, age 46 ; occupation, clerk ; had gonorrhœa 25 years ago, but denied syphilis.

Symptoms.—Lightning pains for ten years, becoming more frequent and more intense lately. Seven years ago he began to falter when walking, and his difficulty in walking has gradually increased. Three days before admission the pains had become so acute that morphia had to be administered. He has had incontinence for seven years, but no gastric crises or girdle pains.

Physical Signs.—Knee jerks absent ; Argyll-Robertson pupils ; early optic atrophy ; Romberg's sign well marked ; very ataxic gait ; inco-ordination, and loss of sensation over the legs and over a band-like area stretching round the chest ; loss of control of bladder sphincter and impotence.

Wassermann's Reaction.—Positive.

Injections.—75 gram neo-salvarsan intravenously ; 24 c.c. of serum obtained from the blood injected intrathecally.

Results.—A lot of pain followed the injection. The lightning pains ceased ; and the gait was improved, but there was no alteration of reflexes, and no increased control obtained over the bladder.

Examination of Blood, etc.—The blood contained arsenic ; the urine contained arsenic ; the cerebro-spinal fluid showed a

very minute trace of arsenic. The cerebro-spinal fluid was under slight pressure, but gave no deposit. Microscopically no cells were seen.

CASE 6.—Male, age (?) 54; occupation, estate agent. History of syphilis in early youth, but wife has had four children, and no miscarriages.

Symptoms.—Lightning pains for past ten years, gradually becoming worse. Difficulty in walking. No gastric or bladder crises.

Physical signs.—Knee jerks absent. Argyll-Robertson pupils. Romberg's sign present. No marked loss of sensation. Ataxic gait. No loss of control over the sphincters.

Wassermann's Reaction.—Positive.

Injections.—75 grams. of neo-salvarsan injected intravenously in the early morning. Blood withdrawn later in the same day. 18 c.c. of serum injected intrathecally.

Result.—No reaction from injections. The pains ceased and patient felt much better.

Examination of blood, etc.—The blood showed the presence of arsenic. The urine showed the presence of arsenic. Arsenic was found in the cerebro-spinal fluid.

CASE 7.—Male, age 52; occupation, labourer. Had a chancre 23 years ago, and underwent three months' treatment.

Symptoms.—Lightning pains during past three years. Slight incontinence of urine for past two years. Right knee enlarged during past eight months. No gastric crises or girdle pains.

Was treated with mercury inunctions four months before admission without any relief to his symptoms.

Physical Signs.—Knee jerks elicited with difficulty on reinforcement. Argyll-Robertson pupils. Optic discs normal. Romberg's sign present. Ataxic gait. Incontinence of urine.

Wassermann's Reaction.—Positive.

Injections.—75 gram. of neo-salvarsan intravenously; 18 c.c. of serum prepared from blood withdrawn 24 hours after injection of the neo-salvarsan injected intrathecally.

Result.—The pains were greatly increased for 24 hours after the injection. The lightning pains ceased and patient's walk seemed to be improved.

Examination of the blood, etc.—Arsenic present in the urine for 192 hours following injection of neo-salvarsan. Trace of arsenic present in the cerebro-spinal fluid. The cells in the cerebro-spinal fluid were not increased in numbers; the few present were mainly mononuclears with a few endothelial.

Five Cases of Sclerosis and Interstitial Cord Lesions.

CASE 1.—Male, age 29; occupation, miner. No history of specific disease; wife has had six children and one miscarriage.

Symptoms.—A year before admission patient had a "fit" during which he was rigid and speechless. Half an hour after the "fit" he started speaking with a stammer and he has spoken like this ever since. Increasing stiffness of the left leg during past eight months. In the early period of this affection he underwent eleven weeks' treatment in hospital with no beneficial result.

He has been unable to walk for the past four months, during which time he has had great pain in the legs. The right leg began to be stiff four months ago.

Physical Signs.—Cranial nerves normal except for slight lateral nystagmus. Reflexes: Knee jerks brisk; extensor plantar response in both legs; patellar clonus present on left side. Both legs very spastic. No wasting of muscles, but the power is weaker than normal, the left leg being weaker than the right; considerable pain on movement of legs, particularly the left. Round, pigmented tissue paper scars over the legs. Mental condition much impaired. Incontinence of urine began before any active treatment was commenced.

Wassermann's Reaction.—Positive.

Injections.—6 gram neo-salvarsan injected intravenously; 18 c.c. of serum, obtained from blood 24 hours after neo-salvarsan injection, injected intrathecally.

Result.—No reaction to the injections. There was a temporary cessation of pain in the legs, but owing to patient's mental condition and incontinence of urine and fæces he was discharged.

CASE 2.—Female, age 38. Occupation, housewife. Patient has had six children, one miscarriage and one stillborn child.

Symptoms.—Two attacks during successive pregnancies of stiffness of the right leg which wore off with use during the day, and became normal again after the pregnancy had terminated. She frequently felt her leg become numb for a few minutes. Twelve months ago the leg suddenly became useless and she fell to the ground. She received hospital treatment for 17 days. The right leg became stiffer and painful and was finally bent up under her. Incontinence of urine for eight months and fæces for three.

Physical Signs.—Right leg flexed at a right angle at the knee joint; left leg flexed but not to the same extent. Both legs stiff and rigid and movement of them caused pain. No contractures present.

Reflexes.—Knee jerks brisk; ankle and patellar clonus present on the right side, but not on the left. Incontinence of urine and fæces. No alteration in sensation.

Wassermann's Reaction.—Positive.

Injections.—6 gram neo-salvarsan injected intravenously. The serum derived from 4 oz. of blood, withdrawn 24 hours after the neo-salvarsan injection, injected intrathecally.

Reaction.—Slight rise of temperature occurred. No definite improvement from the injections. The cells in the cerebro-spinal fluid were not abnormally increased.

CASE 3.—Male, age 31; occupation, engineer's fitter. Has spent four years on the West Coast of Africa. Denied specific disease. Has had "craw-craw" and malaria.

Symptoms.—Patient had a feeling of malaise for a few days. He lost his voice suddenly for a few minutes, and the

next day he was found sitting in his chair speechless, and paralysed down the right side. Took no notice of his surroundings.

Physical Signs.—Sensory and motor aphasia. Left optic disc slightly paler than right. Complete paralysis of right arm and leg. Incontinence of urine and fæces.

Wassermann's Reaction.—Negative; also negative immediately after provocative-dose of neo-salvarsan, but strongly positive a week later.

Injections.—75 gram. neo-salvarsan injected intravenously. Serum obtained from blood injected intrathecally 24 hours later.

Result.—No reaction to injections. Patient appeared to take more notice of his surroundings and to understand orders better, but no improvement in his incontinence or speech occurred.

Examination of blood, etc.—Arsenic present abundantly in the blood. Just perceptible trace of arsenic in the cerebro-spinal fluid. The cells in the cerebro-spinal fluid were not increased in numbers.

CASE 4.—Male, age 44; occupation, fitter. Had a chancre 24 years ago, and underwent three months' treatment for it. Wife has had ten children and one miscarriage.

Symptoms.—Pains at the bottom of the back, made worse by bending, which began eight months ago, and which have been gradually getting worse. Difficulty in walking during past six months. Increasing deafness during the past year.

Physical Signs.—Knee jerks brisk. Plantar response extensor on both sides. Ankle clonus and pseudo-patellar clonus present on the right side. Pupils and optic discs normal. Ataxic gait. Slight Rombergism present. Deafness; left ear greater than right. No middle ear disease.

Wassermann's Reaction.—Positive.

Injections.—75 gram. neo-salvarsan intravenously. The serum obtained from blood withdrawn 24 hours after the neo-salvarsan injection, injected intrathecally.

Results.—No reaction to the injections. The pain at the bottom of the back ceased, and patient was much steadier on his feet, and able to walk better. There was no alteration of reflexes.

Examination of blood.—The blood contained arsenic. The cerebro-spinal fluid contained arsenic in small quantity. The cells in the cerebro-spinal fluid were few in number, being about normal. There was a slight increase in the number of mononuclears.

CASE 5.—Male, age 39; occupation, collier. Had syphilis four years ago and received 18 months' treatment.

SYMPTOMS.—For past two years has had a feeling of nausea in the morning and evening without actually vomiting. Feeling of lassitude and weakness which prevented him working. A month after he had stopped work he began to have difficulty in walking. The legs felt numb and useless, and he had pains and tingling sensations in them. He had incontinence of urine at night and was impotent.

Physical Signs.—Pigmented circular scars seen on the trunk and limbs. Knee jerks exaggerated; patellar clonus present on right side; extensor plantar response present on both sides; Romberg's sign well marked; no alteration in sensation; no wasting of muscles in the legs, but some loss of power. The pupils were unequal (patient affirmed that this has always been the case) but reacted both to light and accommodation.

Wassermann's Reaction.—Positive.

Injections.—75 gram neo-salvarsan intravenously; 24 hours after this injection blood was withdrawn and the serum obtained from it injected intrathecally.

Result.—The only reaction to the injections was slight pain at the bottom of the back. The feeling of nausea and the pains in the legs were less, but a few months later patient considered that his condition was the same as before the injection.

Examination of blood.—The blood contained no arsenic. The cerebro-spinal fluid contained a trace of arsenic; the urine

contained arsenic. The cells in the cerebro-spinal fluid were not abnormal in number or type.

* * * * *

Other methods have been devised for the intrathecal injections, of which the following may be mentioned.

*Swift's Method*²².—An hour after the intravenous injection of .45 gram. neo-salvarsan, 60 c.c. of blood are withdrawn into a sterile flask. This blood is allowed to clot. The separated blood serum is diluted with normal saline solution to form a 40 per cent. mixture, and is kept at a temperature of 56°C for an hour. Next day 30 or 35 c.c. of this solution is introduced intrathecally by gravity, some cerebro-spinal fluid having been previously withdrawn for control.

*Campbell's Method*²³.—This method differs from the above in that the blood is allowed to clot in a sterile vessel, the vessel standing in a jar of 5 per cent. carbolic lotion for 12 hours, and the undiluted serum so obtained is injected. The blood is withdrawn six hours after the neo-salvarsan injection.

I am entirely in agreement with Campbell in injecting the undiluted serum. The method I have adopted differs from those above in that I have withdrawn the blood from the patient 24 hours after the injection instead of one hour. This allows more time for combination to take place between the neo-salvarsan and the serum proteins, and also the experiments mentioned above seemed to show that more free arsenic was present in the blood serum at this period. A further advantage is that it allows the patient 24 hours to recover from the effects of the neo-salvarsan injection. The other points in which my method differs from those given above is that I obtained the serum by centrifugalising the blood, more serum being obtained from a given quantity of blood by this means than by allowing the same quantity of blood to clot; the intrathecal injection can also be made within an hour of withdrawing the blood instead of leaving the blood to stand from 12 to 24 hours, with the possible risk of infection.

In the first method the blood serum solution is kept at 56°C for one hour. This procedure seems to me to be dangerous,

as it does not sterilise the serum completely, although it may kill off many organisms, and so may give the operator a false sense of security, possibly allowing him to become less exacting in his aseptic technique. Neo-salvarsan is destroyed most readily by heat, and so this partial sterilising may alter the composition of the drug, possibly rendering it worthless or even harmful.

RESULTS OF TREATMENT.

It is a well-known fact that if a nerve cell has once degenerated it cannot recover, therefore, however successful the above treatment may be, the patient can never recover completely; the best we can hope for is to arrest the progress of the disease.

The effect of the treatment is largely to allay or abolish the subjective symptoms, and this improvement might be attributed to "suggestion." It is therefore desirable that some more definite and tangible evidence should be brought forward. Campbell²⁴ has suggested that the following points should be investigated :

- | | |
|-----------------------------------|-----------------------------------|
| 1. The condition of the reflexes. | |
| 2. The Wassermann reaction. | |
| 3. The lymphocyte count. | } in the cerebro-spinal
fluid. |
| 4. The globulin reaction. | |
| 5. The percentage of albumen. | |
| 6. The weight of the patient. | |

In the cases quoted I was never able to find any definite changes in the reflexes. The alteration of the reflexes must depend upon how far the degeneration of the nerve cells and fibres has progressed; if the degeneration is extensive it is probably impossible to alter them by any treatment.

A change in the Wassermann reaction is a most useful guide. To bring this about several injections are required and I am of the opinion that more than one injection should always be given. The Wassermann reaction is not infallible, as it may become negative through ordinary antisyphilitic treatment, or it may even be negative at the outset.

With regard to the lymphocyte count, I was unable to find sufficient variation from the ordinary count to justify any conclusions being drawn.

If trypan blue be injected by lumbar puncture it is found that only the cord and brain stem become coloured with the pigment; it is therefore possible that no salvarsanised serum injected by this route reaches the brain. This would account for the failure of the treatment in general paralysis of the insane or Cases 1, 3, and 5 in the second series recorded above. To counteract this difficulty Ballance²⁵ has made injections of salvarsanised serum into the ventricles of the brain, with apparently good results. The operation was well borne, but here again this treatment is in its infancy and it is too early to draw any conclusions.

I have attempted to show that in the above cases the serum which I injected into the spinal theca contained arsenic in a form likely to be active on the spirochaetes in the central nervous system.

Campbell²³ advocated the use of mercury and potassium iodide and the ordinary antisyphilitic treatment in conjunction with the intrathecal injections. The above cases, however, received no other specific treatment than the injections, so that such improvement as was obtained was due entirely to the injections.

CONCLUSIONS.

The results obtained in the cases quoted above are by no means uniform, but the following conclusions may be drawn :—

1. The neo-salvarsan or salvarsan injection should be made by venepuncture, so as to avoid the scar which results from the open operation.
2. It is advantageous to use doubly distilled water for dissolving the drug, as the after effects of the injection when this water is used are very slight.
3. That rigid asepsis in all manipulations is of paramount importance, as infection may be followed by disastrous consequences.

4. A compound is probably formed in the blood between the neo-salvarsan and the serum proteins, which is strongly active against the specific organisms.

5. The cerebro-spinal fluid rarely contains any arsenic after an intravenous injection of neo-salvarsan.

6. Patients with symptoms of an irritative character such as lightning pains, gastric crises, etc., frequently suffer from an acute attack of these pains, which lasts from 12 to 24 hours after the injection, is easily controlled by morphia, and need cause no alarm to the physician, as the symptoms come on too soon after the injection to be due to sepsis.

7. There is generally improvement or cure of the subjective symptoms, but no change was ever effected in the reflexes.

8. The unsatisfactory results obtained in the cases of sclerosis and interstitial cord lesions is due to the fact that in these cases it is rather a matter of physical signs than symptoms, and so little improvement would be expected.

9. Several injections are probably necessary to give permanent relief to the symptoms or to bring the active progress of the disease to an end.

10. This method is still on probation, but from a consideration of the pathology of the tissues involved it seems the most rational one yet introduced for the treatment of syphilitic lesions of the central nervous system.

11. This method probably will never become very popular with the profession, owing to its difficulties, dangers, and tediousness, but it is worth trying when the other treatments have failed on account of the miserable existence led by patients suffering from tabes with any of its irritative manifestations. Relief or cure of the subjective symptoms being a distinct gain.

From a consideration of the cases published by Swift²⁶, Campbell²³, Grainger Stewart²⁷, McDonagh²⁸, Turner²⁹, and Wile³¹, and from other unpublished cases which I have had the pleasure of seeing in addition to the series given above, the method has not given as good results as might have been expected on purely theoretical grounds, owing possibly to the extreme sensitiveness of the central nervous system to any drug

or toxin, thus preventing a sufficient amount of the drug from being introduced to be entirely effective on the spirochætes. This method holds out possibilities when further work and research has been done, and McIntosh's³⁰ sweeping criticisms are hardly justified on the evidence which he brings forward.

In conclusion I wish to express my very best thanks to Professor F. H. Edgeworth for his kindness in allowing me to publish these cases, and for his invaluable help and sympathy with the work. To Dr. J. A. Nixon I am indebted for much advice with regard to the injection of neo-salvarsan, and for permission to publish one of the above cases. The Wassermann reactions were carried out by Professor Walker Hall by Wassermann's original method, and this fact is sufficient guarantee of their absolute accuracy. I am also greatly indebted to Mr. A. L. Taylor for valuable help in the examination of the blood and urine for the presence of arsenic.

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ANATOMY FROM BIRMINGHAM.*

SIXTEEN years have passed since there appeared a publication under the title of "The Myology of the Pelvic Floor"—one which arrested the attention of the professional anatomist. The author was Dr. Peter Thompson, Senior Demonstrator of Anatomy in the Queen's College, Manchester. It was a real and finished addition to our knowledge of anatomy; the text and illustrations were of the first order of excellence; it was evident to the practical physician, as to the professional anatomist, that the thin ranks of the regiment of British anatomists had gained a more than promising recruit.

The recruit has fulfilled the promise of his early years. In the laborious medical schools of London he earned his promotion as a teacher, and at an early point of his career he was quick to see that the old hum-drum days when a reputation could be gained by the mere use of a knife and forceps were dead. So he went abroad in his vacations to study in the laboratories of the Continent, and came back a master of the newer technique—a technique which is reflected in nearly every page of the latest volume that stands to the credit of himself and pupils—one which Birmingham University has every right to be proud of. His enthusiasm has always been infectious; that, too, is reflected in the volume of studies just issued, for while, of the eight investigations which make up that volume, the first and last are by himself, the rest are by the members of his staff or by his pupils.

Anyone in search of startling, sensational discoveries will not find them amongst these Studies. Their contents are of a different order; they are solid blocks cut with care and accuracy from Nature's quarry, wrought slowly, laboriously,

*Studies in Anatomy from the Anatomical Department of the University of Birmingham. Published by the Council of the University and edited by Professor Peter Thompson. Cornish Brothers, Ltd., Birmingham, 1915.

with a very definite end in view—a lasting foundation for the superstructure of practical medicine. The basis on which we medical men build is a full and true knowledge of the human body. We cannot know that body too well. So far as the scalpel can lay bare the details of the human frame we know it fairly well; but then the human body has a long history, passes through a diversity of phases before it reaches a size big enough for us to apply to it a knife and forceps. The very first study is devoted to the investigation of a human embryo which has reached the end of the fourth week from the time it was a simple-looking ovum; but it is only 7 mm. long—little more than a quarter of an inch. A knife and forceps in this case can prove of little service. There is only one way—the patient, laborious but accurate and final way of dividing that embryo into some 400 regular and systematic sections, magnifying each section one hundred times or more, and then, by setting these magnified sections together, obtain a magnified but accurate model which anyone may see and handle and dissect and redissect until every recess and every fibre in its body is known. That is what Professor Thompson has done in his first study; placed the materials for a thorough knowledge of the human body at the end of the fourth week of development at the disposal of every medical man—not only now, but for all time. He is not the first to have accomplished this task, but no one has done it better, and very few have done it nearly so well. He has checked on this point and verified on that, and added and extended in nearly all. Is it the human heart you are studying? You will find that the heart of the 7mm. embryo can help you to resolve your problems—whether they be clinical, pathological or merely anatomical. It is so with every system of the body—the stomach, the diaphragm, the thyroid, the pituitary; in every case you will find that the embryonic condition may help you to understand the nature and function of obscure organs.

The last paper in this volume is a good example of how a knowledge of embryology may throw light on an obscure condition. Surgeons occasionally find the gall-bladder deeply embedded in a fissure of the liver; in such cases it will be found

that the round ligament of the liver is contained within the same fissure, and that the area of the liver, the quadrate lobe, which normally separates the gall-bladder from the fissures containing the round ligament, is absent; the quadrate lobe has failed to develop. Professor Thompson suspected that embryology would throw light on this condition. He was right. An investigation showed that at one stage of development the gall-bladder does lie in the same fissure as the round ligament, and that the quadrate lobe is comparatively late in its development. The condition thus occasionally observed by the surgeon represents an arrest of development. The cause of that arrest is an interesting but a more difficult problem to solve.

It is the quality of all good scientific work to be cosmopolitan in its aim; the investigator sets out to discover the processes involved in producing a certain result; the immediate application of the facts he may discover is a matter of indifference; if his observations are of practical application then so much the better—but the first aim is an extension of knowledge. To this category of research belong the studies and reconstructions of the embryo of the ferret by Dr. Thomas Yeates, now Lecturer on Anatomy in the Medical College of Middlesex Hospital. To the unthinking onlooker Dr. Yeates' investigation may seem far outside the problems which confront medical men. If the sceptic will look into those two finished studies by Dr. Yeates he will find that the ferret can render mankind a service outside the realm of rabbit warrens. All the complexities of the human heart can be studied in the developing heart of the ferret, and from his studies of the simple double-tube heart of the developing ferret, Dr. Yeates has drawn inferences which can be strictly and profitably applied to the human heart.

The four remaining papers are examples of the profitable application of embryology to obscure, but not uncommon, malformations of the human body. Mr. Lewis Graham gives a good account of the condition of agnathia—the lower jaw and all the parts derived from the mandibular arch being so arrested in growth that the earholes almost meet in front of the neck. Mr. Bernard Goodwin's study of a case of partial torsion of the

intestinal loop, which first appeared in this review, is also included in the volume of studies—an excellent example of how embryology can clear up conditions which would otherwise prove puzzling to the surgeon. Dr. J. Percy Good's inquiry into the causation of *spina bifida* is published here for the first time. Those who are dealing with this condition by the adoption of surgical measures will find it advantageous to study the records made by Dr. Good. The Anatomical Department was able to place ten cases at his disposal for dissection and examination. Finally the paper by Miss Marion Radford, "On the Head Notochord and Pharyngeal Bursa in the Ferret and other Mammals" deserves our praise. And yet, accurate and valuable as are the observations recorded by Miss Radford, the reviewer is of opinion that there is much yet to be done before we can say that we really understand the origin and true nature of what most clinicians agree to call the "bursa of the pharynx."

ARTHUR KEITH.

REPORTS OF SOCIETIES.

MIDLAND OPHTHALMOLOGICAL SOCIETY.

THE second meeting of the Society was held at the Birmingham and Midland Eye Hospital on Tuesday, December 7th. In the absence of the President, Mr. Russ Wood was voted to the chair.

The following new rule, proposed by Mr. Wood-White and seconded by Mr. D. Priestley Smith, was unanimously adopted :—"Any member whose subscription is more than two years overdue shall cease to be a member of the Society."

Mr. P. H. Adams, of Oxford, was elected a member of the Society.

Mr. St. Clair Roberts showed three cases of "ray cataract" in chainmakers from the Lye district.

The opacity was situated in the posterior part of the cortex, and was very defined and opposite the pupillary area, the size of which it seemed to correspond to. Compared with the cataract seen in glassblowers and puddlers the opacity was more circumscribed and did not present the bowl-shaped appearance generally seen in those cases. We hope to publish a detail account of this type of cataract and the extent of its distribution in the Black Country in an early issue of this journal.

Mr. Sydenham showed a case of dacryocystitis which had been cured by his *modified West's operation*. There was no epiphora or deformity, and the result was perfectly satisfactory to the patient.

Mr. Jameson Evans showed a case of colloid degeneration of the choroid in a woman aged 54 years. The whole of the fundus was bespattered with fine pearly spots which were larger in the central region where several smaller spots seemed to have coalesced. No complaint of defective vision had been made until last August, when the patient presented herself owing to failure

of sight in the left eye, the vision in the right eye at that time being $\frac{6}{8}$. It was found that the appearances of the fundus were practically identical in both eyes but there was a very small hæmorrhage at the yellow spot in the left eye. Within the last fortnight the vision of the right eye had fallen to $\frac{6}{18}$, and ophthalmoscopic examination now shows a very small hæmorrhage at the fovea in this eye also. The fields in both eyes are slightly contracted. The hæmorrhages were ascribed to rupture of the retinal capillaries due to excessive arterial pressure.

A PECULIAR FORM OF CHOROIDO-RETINITIS.—A girl aged 19 years complained of distortion of straight lines which become wavy occasionally. Her vision was normal with myopic correction.

Both fundi presented extensive orange patches with crescentic and sinuous borders, over the centres of some of which were buttons of black pigment situated chiefly in the retina. The choroidal affection appeared quiescent and there was no recent retinitis visible. The condition was possibly of specific (hereditary) origin.

CONGENITAL PIGMENTATION OF THE SCLEROTICS.—A woman aged 48 years showed discrete patches of brown pigment in the episcleral tissue over the greater part of the visible portions of the sclerotics. They had been present and known to the patient since early childhood, and had not, to her knowledge, changed in any way in later life. There was no other pathological change in the eye beyond some corneal nebulæ, the result of old ulcers.

Mr. Harrison Butler showed the following cases :—

(1) *Obsolescent tubercle of the choroid juxta-papillaris.*

(2) Changes in the fundus caused by *shell-shock*. There were extensive retinal hæmorrhages and the lower retinal vessels were represented by white lines such as are observed after thrombosis of the artery.

(3) *Bulbous Keratitis*.—The centre of the cornea in each eye showed a somewhat circumscribed grey opacity with bullous oedema of the corneal epithelium, with little or no ciliary injection or signs of deep inflammation of the eye, but the Wassermann reaction was positive.

(4) *Detached retina* with subretinal deposit suggestive of a new growth.

(2) *Coloboma of the lower part of the lens* in each eye.

MIDLAND MEDICAL SOCIETY.

THE third meeting of the Session was held at the Medical Institute on Wednesday, November 24th, the President, Mr. Leedham Green, being in the chair.

Mr. Bertram Lloyd showed a case of intrauterine amputation through the right thigh at the middle of the shaft of the femur. There was no sign of the amputated limb in the amniotic fluid at the time of birth.

He also showed a case of congenital furrowing of the arm by amniotic band. There was annular constriction of the right forearm, involving only the soft tissues, two inches above the wrist. There were associated deformities, viz., right talipes equino-varus and left talipes calcaneo-valgus.

Mr. Jameson Evans showed a case of angio sarcoma of the orbit in a girl aged ten years, which had been treated with marked benefit by means of radium emanations. The little tube had been inserted into the middle of the large and highly vascular growth through an incision in the lower conjunctival fornix, and was left *in situ* for twenty-two hours. Perceptible diminution in the size of the growth became apparent within a week, and in a month had been reduced to about half its original size. During the last month the growth had perceptibly increased again, and had practically regained its former dimensions.

Mr. R. Beatson Hird showed a case of sarcoma of the right orbit.

History.—The patient, aged 52, first noticed a swelling about eight months ago, which gradually got worse. There has

only been a little pain. Four months ago she first noticed "seeing double" and has done so ever since. This is most marked on looking downwards. There has been some bleeding from the nose, but only slight. She first attended the Birmingham Eye Hospital on September 20th last.

Physical Signs.—A firm mass in the floor of the right orbit which displaces the eyeball upwards and limits its downward rotation. There is expansion of the upper jaw and the antrum is dull on transillumination. The preauricular gland is enlarged.

Treatment.—On September 29th incision along the lower edge of the orbit, under general anæsthesia, and a tube of radium emanation strength 60mgr. embedded in the growth and left in for 23 hours. At the same time a piece of the growth was removed for examination and is now shown under the microscope. The radium treatment does not appear to have affected the growth, which has undergone no definite change unless it is a little more extensive.

Microscopic Section (report by Dr. Assinder).—An atypical sarcoma tending to become almost alveolar and carcinomatous.

Mr. G. P. Mills showed a case of tumour of thigh.

History.—Probable history of syphilis many years ago. Three months ago lump was first noticed in right thigh; it has not appreciably altered in size since then and there is no history of injury. It is quite painless.

Points for Examination.—

- (1) Tumour in extensor muscles of right thigh.
- (2) Several subcutaneous tumours on front of thighs and on left buttock.

Diagnosis.—

- ? Fibro-sarcoma.
- ? Indurated lipoma.

N.B.—The small subcutaneous tumours which are obvious lipomata have been present for several years.

Dr. Emanuel showed a case of Hirschsprung's disease and Mr. Billington one of sacral teratoma which we hope to publish in detail.

NOTES AND NEWS.

UNIVERSITY OF BIRMINGHAM.

THE following candidates satisfied the Examiners in the Final Examination for the degree of M.B., Ch.B. held this month :—

A. D. Millington.
Gladys M. Turner.

ROYAL ARMY MEDICAL CORPS.

N. Mid. Field Ambulance.—The undermentioned to be lieutenants : D. A. Wilson, M.B., J. Howard (November 24).

Southern General Hospital.—Lieut. A. H. Newton, M.B., to be captain (November 14).

Southern General Hospital.—Lieut. W. A. Stokes to be captain (November 8).

S. Mid. Mounted Brigade Field Ambulance.—Lieut. E. P. Dawes, from attached to units other than medical units, to be lieutenant (December 12).

FINANCES OF WOLVERHAMPTON GENERAL HOSPITAL : EFFORT TO WIPE OFF £8,000 DEFICIT.

THE serious financial position of the Wolverhampton General Hospital was discussed at a meeting on Saturday. It was stated by the representatives of the employes at about fifty works in the town and district, that the workmen were willing to increase their weekly subscriptions in a great endeavour to wipe off the deficit of about £8,000. A representative of Messrs. J. Sankey and Sons, Limited, stated that the workmen had decided to contribute £50 ; and it was mentioned that the workmen at the steel works of Sir Alfred Hickman, Limited, Spring Vale, Bilston, were willing to contribute approximately £300, which was in reality a three months' contribution.

Mr. W. H. Harper (secretary) said the Board of Management of the hospital had not issued a public appeal, but, notwithstanding that, a sum of £823 had been promised, including the following amounts:—Mr. John Marston, £100; John Marston, Limited, £100; Mr. G. N. Adams, £100; Mr. T. B. Adams, £100; Messrs. Bayliss, Jones and Bayliss, £105; Messrs. W. Butler and Co., Limited, £105; Mr. E. Swindley, £50; Mr. Farnworth, £25; Anonymous, £20; Mr. A. Holloway, £10 10s.; and Mr. John Scott, £100 (if £1,000 is obtained). Mr. Harper added that the hospital was not in debt because their income had gone down, but it was owing to the fact that the expenditure had increased during the past few years by 33 per cent. The expenditure, however, was absolutely necessary in justice to the needy poor of the town and district. An appeal to the teachers of Wolverhampton which was contemplated would result in a contribution of £200 a year.

Eventually it was decided to issue a general appeal to the workers of the town to increase their weekly contributions.—*Birmingham Daily Post*, November 29, 1915.

MEDICAL WHO'S WHO.

THIS annual will in future be issued by the Fulton Manders Publishing Company, of 75, Chancery Lane, E.C.

The publishers advise us that the fifth edition will contain some 15,000 biographies, besides additional information both useful and of value to all concerned.

In 1912 the work consisted of 300 pages, whereas last year there were over 1,000, and in the coming issue there will be at least 1,500, which shows how the work has grown.

The book has been offered to subscribers in advance at 9s., or it can be obtained on publication at 10s. 6d. net.

Further particulars can be had from the offices at the above address.

BOOK REVIEWS.

Injuries of the Eyes, Nose, Throat, and Ears. By A. MAITLAND RAMSAY, M.D., F.R.F.P.S., J. DUNDAS GRANT, M.D., F.R.C.S., H. LAWSON WHALE, M.D., F.R.C.S., and C. ERNEST WEST, F.R.C.S. London: Henry Frowde and Hodder & Stoughton. 1915. Price 2s. 6d. net.

THIS is one of the handy khaki-bound "Oxford War Primers" which have been published at a very opportune time by this enterprising firm. In a little over 150 pages the authors have managed to compress a vast amount of useful information, largely gathered from personal experience of the present war, on the somewhat wide subjects of Eyes, Nose, Throat, and Ears. There is no room in a primer of this sort for anything but the essentials of the practical side of the military aspects of the injuries of these special regions. Each author has closely followed this view and treated his subject with commendable brevity.

Maitland Ramsay occupies 65 pages with the Ophthalmic Section, and it is remarkable how much practical information he has been able to compress into such small space. Perhaps a few more pages might have been allowed him, so that the subjects of "shell shock" and the ocular lesions of transorbital bullet wounds might be mentioned in more detail.

The Section on Nose and Throat, by Dundas Grant and Lawson Whale, is thoroughly practical, and contains many useful suggestions. The military surgeon who is not a specialist on the subject can gather from these brief but lucid remarks what is to be expected of him in cases of injury of the nose and throat. Illustrative cases are wisely separated from the general text, and are sufficiently interesting and instructive to be read by themselves.

Injuries of the Ears, by C. Ernest West, is naturally a very brief section, but contains all that the military officer is

likely to want to know for the immediate treatment of such cases. In every section the descriptions are given in simple language, and the technical jargon of the specialist seems to have been carefully avoided.

This primer seems admirably adapted for the use of military surgeons who may be called upon to deal with cases of injuries of these regions on active service at the front, and a study of its contents should enable them to render valuable immediate service to the wounded and to discriminate between those that can be treated by them on the spot and those who require more expert advice at a base hospital.

The Medical Annual Synoptical Index, 1905-1914. Bristol : John Wright & Sons, Ltd. 1915. Price 8s. 6d. net.

THIS work is an index to the articles which have appeared in The Medical Annual from 1905 to 1914 inclusive, and this is tantamount to stating that it is an index to medical literature generally during that period, so complete are the reviews of current literature in The Medical Annual.

As an index to The Medical Annual it renders the possession of the yearly volumes of vastly greater service to the practitioner, as they will now form a ready reference library to him. With this index at hand it is a matter of few minutes to find any article of any consequence which has been published during the last ten years. This is a boon for which the profession is deeply indebted to the editor and publishers of The Medical Annual.

This work is, moreover, something more than a mere index since it supplies us with a vast amount of direct information on methods of treatment, special formulæ and special uses of the newer drugs, and explains the alterations in the British Pharmacopœia of 1914, etc.

This volume will be found invaluable by every practitioner interested in his work, and is quite essential for everyone who wants to use The Medical Annual to the best advantage.

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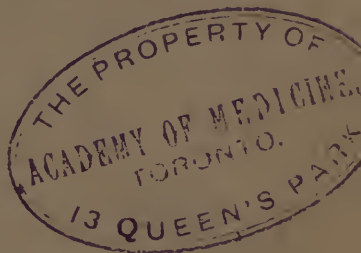
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